

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

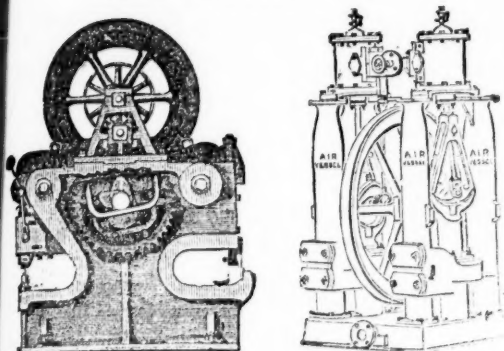
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No. 2168.—VOL. XLVII.

LONDON, SATURDAY, MARCH 10, 1877.

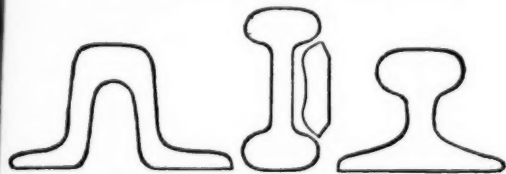
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PARIS,
BRONZE MEDAL, 1867.



ORDER OF THE CROWN OF PRUSSIA.



FALMOUTH,
SILVER MEDAL, 1867.

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the
Geographical Congress, Paris, 1875—M. Favre, Contractor, having
exhibited the McKean Drill alone as the MODEL BORING MACHINE
for the ST. GOTHARD TUNNEL.

SILVER MEDAL of the Highland and West of Scotland
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At the south end of the St. Gothard Tunnel, where

THE MCKEAN ROCK DRILLS

Are exclusively used, the advance made during eight consecutive weeks, ending February 7, was 24'90, 27'60, 24'80, 26'10, 28'30, 27'10, 28'40, 28'70 metres. Total advance of south heading during January was 121'30 metres, or 133 yards.

In a series of comparative trials made at the St. Gothard Tunnel, the McKean Rock Drill continued to work until the pressure was reduced to one-half atmosphere (7½ lbs.), showing almost the entire motive force to be available for the blow against the rock—a result of itself indicating many advantages.

The GREAT WESTERN RAILWAY has adopted these Machines for the SEVERN TUNNEL; the LONDON AND NORTH-WESTERN RAILWAY for the FESTINIOG TUNNEL; and the BRITISH GOVERNMENT for several Public Works. A considerable number of Mining Companies are now using them. Shafts and Galleries are driven at from three to six times the speed of hand labour, according to the size and number of machines employed, and with important saving in cost. The ratio of advantage over hand labour is greatest where the rock is hardest.

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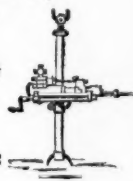
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- 4.—THEY ARE THE ONLY MACHINES THAT MAKE THE ORE CLEAN FOR MARKET AT ONE OPERATION.

They have been supplied to some of the principal mines in the United Kingdom and abroad—viz.,

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WASTE HEAPS, consisting of refuse chatts and skimpings of a former washing, containing a mixture of lead, blende, and sulphur, DRESSED TO A PROFIT.

Mr. BAINBRIDGE, C.E., of the London Company's Mines, Middleton-in-Teesdale, by Darlington, writing on the 20th March, 1876, says—"The yearly profit on our Nenthead waste heaps amounted last year to £800, besides the machinery being occupied for some months in dressing ore-stuff from the mines. Of course, if it had been wholly engaged in dressing wastes our returns would have been greater; but it is giving us every satisfaction, and bringing the waste heaps into profitable use, which would otherwise remain dormant."

Mr. T. B. STEWART, Manager of the Duke of Buccleuch's Mines, Wanlockhead, Abington, N.B., writing on 20th March, 1876, says—"I have much pleasure in stating that a full and superior set of your Ore Dressing Machinery has been at work at these mines for fully a month, and each day as the moving parts become smoother, and those in charge understand the working of the machinery better, it gives increasing satisfaction, the ore being dressed more quickly, cheaply, and satisfactorily than by any other method."

Mr. BAINBRIDGE, speaking of machinery supplied Colberry Mines, says—"Your machinery saves fully one-half on old wages, and vastly more on the wages we have now to pay. Over and above the saving in cost is the saving in ore, which is a much short of 10 per cent."

GREENSIDE MINE COMPANY, Patterdale, near Penrith, say—"The separation which they make is complete."

Mr. MONTAGUE BEALE says—"It will separate ore, however close the mechanical mixture, in such a way as no other machines can do."

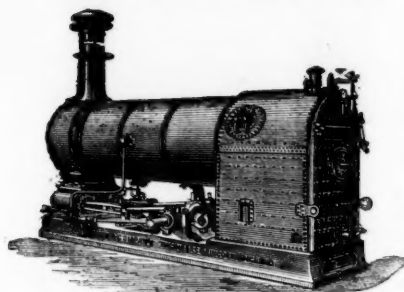
Mr. C. DODSWORTH says—"It is the very best for the purpose and will do for any kind of metallic ores—the very thing so long needed for dressing floors."

Drawings, specifications, and estimates will be forwarded on application to—

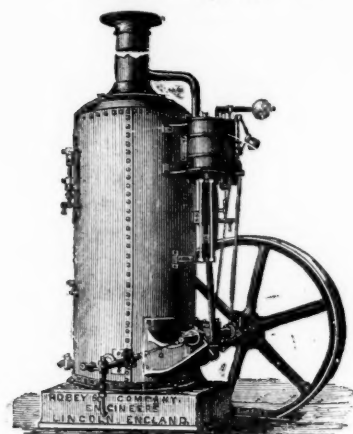
GEORGE GREEN, M.E., ABERYSTWITH SOUTH WALES.

ROBEY & CO., ENGINEERS, LINCOLN,

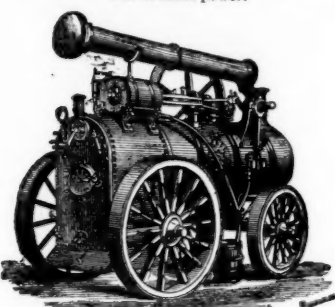
SOLE MANUFACTURERS OF THE



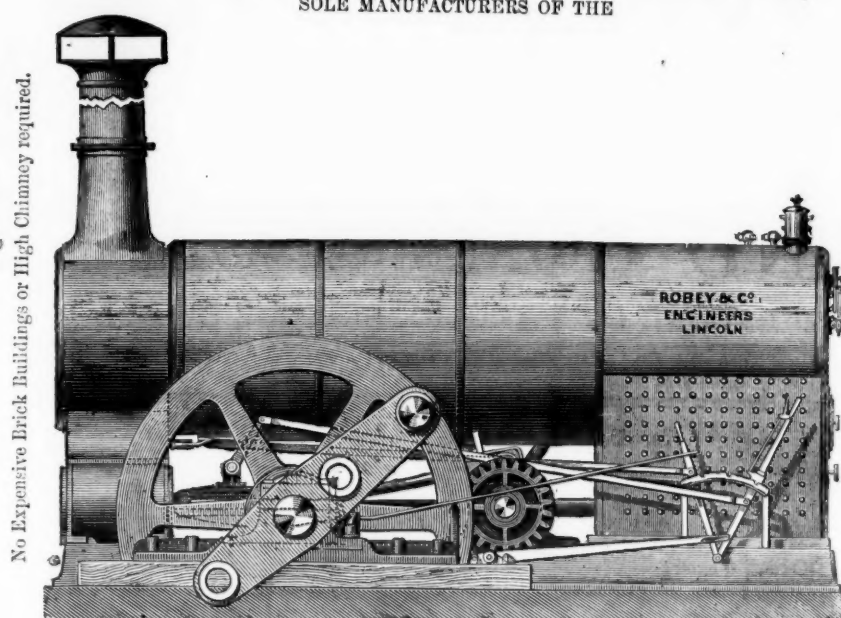
THE PATENT ROBEY FIXED ENGINE AND LOCOMOTIVE BOILER COMBINED, 4 to 50-horse power.



VERTICAL STATIONARY STEAM ENGINE AND PATENT BOILER COMBINED, 2 to 12 horse power.



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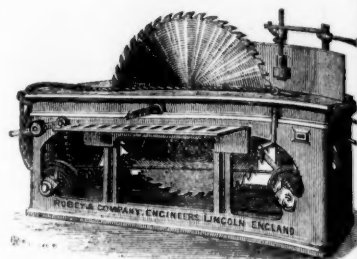
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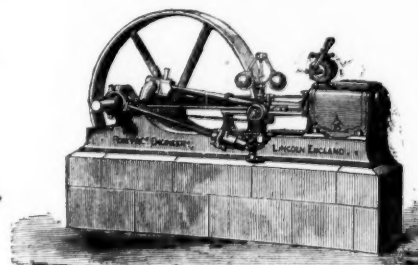
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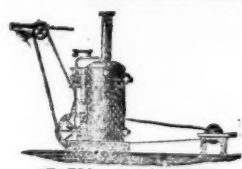


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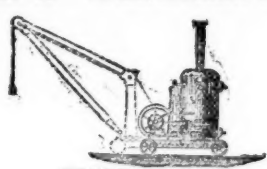


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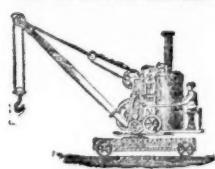
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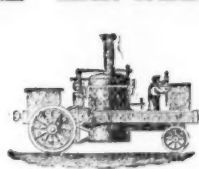
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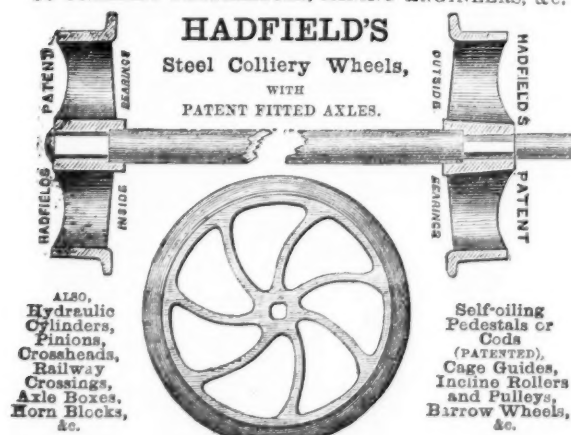
Pumping, Winding, Hoisting, Sawing, Driving Machinery, and for General Contractors' Work, Railway Sidings, Coal Mines, Quarries, Gas Works, &c.

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TO COLLIERY PROPRIETORS, MINING ENGINEERS, &c.



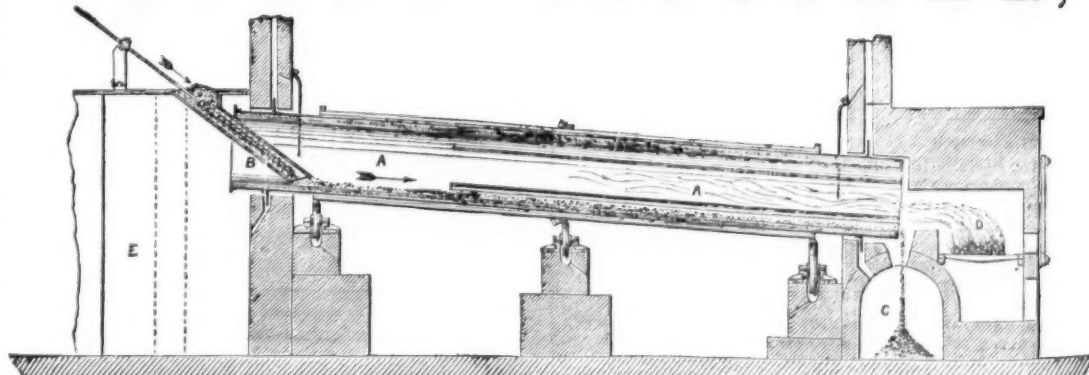
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Mr. JOHN HOCKING, Jun., TREWIRGIE TERRACE, REDRUTH.

Original Correspondence.

OUR COMMERCE IN METALS.

In our report of the imports and exports of metals during the first month of the present year attention was naturally called to the expectations which prevailed throughout the last quarter of 1876 that "the turn of the year," which is now advancing, trade generally, especially in metals, would show considerable revival, and when the first month of the year transpired it was our painful duty to record the signal disappointment of those anticipations. Still the general public, and more particularly miners and manufacturers and exporters of metals, remained sanguine that the opening of spring would effect a favourable change. The first spring month and a third of the month of March have come and gone without those signs of improvement which were relied upon so hopefully. February was probably the most rainy month in the memory of man, rendering such agricultural labour as usually takes place at that period of the year nearly impossible, and consequently disheartening the class most concerned, from purchasing the implements made from metals so extensively used by them. Railway travelling, and even the transport of particular classes of goods, were as much as possible deferred, producing depression in a department in which there is so large a consumption of metals. The building trades both here and in France, a great activity in which was confidently predicted, were at a standstill from the same cause, and the increased demand for lead, zinc, brass, and builders' ironmongery, which it was reasonable to feel assured would take place, did not supervene. The uncertainty of affairs in Eastern Europe impeded the export trade, and capitalists who contemplated fair mining adventure were slow to invest in any undertaking which the advent of war might endanger or injure.

To all these impediments to business—and to mining, one of its most sensitive branches—was added the most extensive and terrible famine ever known in India, and that country is among our best foreign and colonial customers for all the metals, superior and inferior. Looking at the vast famine map hanging in the council chamber at the India Office, some notion may be formed of the area stricken, and the tens of millions impoverished by the calamity. It is to be wondered at that with all these adverse influences the trade in metal should be dull, and that the miner's pick and hammer should in so many instances be silent. The surprise may well be that mining and the branches of business that cannot go on without it should have held up so well. On the whole, a hopeful spirit is still cherished that as the spring advances those departments of trade which the *Mining Journal* represents will revive. The absence of frost and snow through the winter quickens the hope that the Baltic ports will be open at an earlier date than usual, where, undoubtedly, stocks in British metals need to be replenished.

The total value of the import trade for February was 30,542,309*l.*, a falling off of more than 25 millions as compared with February last year. The value of exports of the productions of the United Kingdom was 14,393,745*l.*, a falling off in the same comparison of about 2,100,000*l.*

Our imports of tin for the month of February were of the declared value of 106,823*l.*, compared with 174,125*l.* in the previous February. Of this amount of foreign and colonial tin the value of 72,655*l.* was exported. It is probable that more would have arrived from the Straits and Australia but for its low price in the market, which left so small a margin for profit with our merchants. It is observable that the export of foreign and colonial tin has greatly fallen off, being less than one-seventh of what it was in the corresponding month of February, 1876.

The import of foreign copper ore was 100,388*l.*; regulus, including precipitates, 131,370*l.*; unwrought or part wrought, 300,474*l.*. Comparing these figures with 1876 in the same month there is an increase of ore to the value of nearly 39,000*l.* Of copper wrought or part wrought the difference is nearly 26,000*l.* more last year. Of regulus (precipitates included) there is an increase of over 43,000*l.* The "re-exports" of copper were all wrought or part wrought, and the value was 145,922*l.*. This trade steadily increases; for the figures in February, 1876, were 91,444*l.*, and in February, 1875, 73,495*l.*

Our lead imports were valued at 171,457*l.*, against a little more last year, and a great deal less the year before. As is customary, the Board of Trade makes no report of the quantities or values of foreign lead exported, probably thinking them too small to report. As the President of the Board of Trade only undertakes to publish "the principal items."

Pyrites of iron, copper, or sulphur were received from abroad to the extent in value of 140,420*l.*, and compared with the value in February, 1876, there is an increase of about 25,000*l.*

Zinc or spelter imports, crude or in cake, amounted to 35,896*l.*; February two months it was 44,937*l.*. Manufactures of zinc unenumerated 28,860*l.*, the previous February it was 18,134*l.*. No account is given of the re-export of foreign spelter.

Quicksilver amounted to 74,764*l.*, and in February, 1876, the imports were priced at 77,016*l.*. The re-exports were 20,941*l.* and 39,021*l.* respectively.

The exports of British tin were of the declared value of 28,125*l.*, comparison with the corresponding month of the previous year shows very slight decline in value.

British lead was sent abroad amounting in value to 68,603*l.*; this includes all descriptions—pig, rolled sheet, piping, and tubing. It was slightly more last year. Copper from British mines unwrought in ingots, cakes, or slabs was worth 61,996*l.*, compared with 72,649*l.* in the corresponding month last year. Wrought or manufactured unenumerated 58,807*l.*. February, 1876, it was 72,322*l.*. Mixed or yellow metal sheathing 88,973*l.*. The corresponding month last year it was 77,517*l.*. The total value of British copper exports for February was estimated at 209,776*l.*, and for the February before 222,488*l.*. There has not been much change in the destination of those metals; the last named was sent chiefly to British India, where that trade has increased, as the unrelieved distress of Feb., 1876, caused imports from England to diminish at that time. Lead found its way as usual to China, with which country our exports of the metal are rapidly and largely increasing. Our chief customers for tin were the United States, France, and Germany, with all of which the export increases.

A large amount of the superior metal finds a place in hardware, steam-engines, locomotives, and machinery, although, of course, chiefly composed of iron and steel, and in the case of fire-arms and ammunition copper is an important ingredient. It appears that the value of arms, ammunition, and military stores was nearly 100,000*l.* against a little less in the month with which last February is compared in the returns. Hardware and cutlery are unenumerated, but the total value was 215,793*l.*, against 291,691*l.* the same time last year. Machinery and mill work was valued, exclusive of steam-engines, at 276,863*l.*, which shows a decline of about 25 per cent. upon February, 1876; and steam-engines are estimated respectively at 106,581*l.* and 185,304*l.*

The quality and value of our iron imports and exports* is too detailed and voluminous a subject to give the particulars in an article with the superior metals. Our iron and steel imports were valued at over 270,000*l.*, showing little change in the corresponding four weeks of the previous year. Of this the worth re-exported was in the two periods respectively 21,000*l.* and 30,000*l.*, round numbers.

British iron and steel, and iron and steel combined, in the same unenumerated manufactures, were of the united value of 1,272,906*l.* Last year the amount in February was 1,485,858*l.*; thus the value of our iron exports has again fallen. Not so, however, the quantities, which were last month 138,182 tons, against 135,325 tons in February, 1876; but the falling off in both quantity and value from February, 1875, is as striking as it is to be deplored. The value then was 1,867,873*l.*, and the quantity 154,765 tons. The United States and France have shown a declining demand for our steel; France, Germany, India, and British America are almost the only countries which have increased their custom for iron; but this has not been the case in every branch of the manufacture. It is to be hoped that the worst two months of the year is over, and that with

the spring, the most animating and invigorating season in nature, more enterprise at home and abroad will be developed.

NOVA SCOTIA GOLD FIELD.

SIR,—I enclose you a short abstract of returns for 1876 (in advance of any yet published) and will supplement it with descriptive report by next weekly mail.

District.	Mines.	Mills.	Labour, daily.	Days.	Quant. crushed.	Gold yield.
Sherbrooke	10	4	2	120	37,269	6,205
Oldham	12	2	2	80	15,787	1,705
Waverley	4	2	1	68	21,107	1,661
Wine Harbour	3	1	1	25	7,848	1,929
Caribou	3	2	2	19	6,000	542
Tangier	3	3	2	27	5,274	716
Stormont	2	1	1	11	3,607	370
Gay's River	2	1	1	8	2,504	1,699
Uniake	2	1	1	15	4,752	321
Montagu	2	1	1	5	1,405	81
Unclassified	2	4	2	5	1,474	97
Renfrew	3	1	1	4	1,307	164
Total	48*	23†	10†	357	111,304	13,791‡

* Not in constant work. † Several altogether unemployed. ‡ Ounces.

‡ Excluding conglomerate. † Valuing the ounce at 4*l.* sterling.

Halifax, N.S., Feb. 15. ACADIENSIS.

THE NEW SILVER MINES IN COLORADO.

SIR,—Being now in England on a visit, and coming from an entirely new mining district in the United States, I request the liberty of sending a few lines to the *Journal*, which may be of some interest to those engaged in silver mining. The district I speak of is the San Juan, situated in the south-western part of Colorado, among some of the highest and wildest portions of the Rocky Mountain range, and until the last three years was in the possession of the Indians. It is by no means the place for the man of pleasure, as the snow lies on the ground six months of the year, and the year is truly said to consist of "nine months winter, and three months late in the autumn." But Providence has so ordered that this portion of the continent should have remained unexplored when Utah, Nevada, and California have had their mountains upheaved by the prospector's pick; but here, in one of the richest mineral districts in the world, the bear and the mountain lion still roam, and their happiness is only broken by the adventurous miner, who chance and misfortune has placed in these homeless mountains. Having myself been among the first who entered this district, and having travelled over the greater part of it during the past three years, I take pleasure in saying that few, if any, mining districts in the United States can equal the Great San Juan. The mines are in granite formation, and crop out in many cases for two miles in length, and the whole country is a perfect network of veins. I have with me a collection of ore from about seventy lodes, all of which came from within 4 feet of the surface, and will run from 50 to 1000 ozs. of silver to the ton, many of them carrying a little gold, besides some 50 per cent. of lead, and some of these three months ago no white man had seen. None of the mines are developed; the deepest shaft is only 150 ft.; in that the ore is increasing in quality and quantity, and has paid the men who sunk it a handsome return besides their wages. Another lode I speak of has a 20-ft. shaft, sunk in solid mineral, which runs 400 ozs. to the ton, but how extensive it is or how deep it will go it is hard to say. Travelling still further west, and leaving the higher mountains, the formation changes to limestone, and not long before I left was found an enormous deposit, which has few equals, and covers 50 acres of ground. When I last saw it there were five shafts upon it, but none deeper than 18 ft.; the ore was piled on the dump, and averaged 80 ozs. to the ton. These are some of many I might mention, and I should be pleased to make an appointment and show anyone interested the ores. The mines I speak of are hardly known in the United States, much less in England, but at no distant day will be heard accounts from this district which will greatly surprise the silver mining world.

Inverness-terrace, W. JOHN LEE STUART.

NEWS FROM NEW MEXICO—No. IV.

THE PROPERTY OF THE MAXWELL LAND GRANT AND RAILWAY COMPANY SOLD FOR TAXES BY THE SHERIFF.—A QUESTIONABLE TRANSACTION EXPLODED.

SIR,—Before giving an account of what I found on my further progress south, in this territory, I have to refer to parts of my former correspondence. As predicted in my letter, published in the *Journal* of April 1, the territorial authorities (Santa Fé ring) had the property of the Maxwell Land Grant and Railway Company sold for taxes. After all improvements on the grant had been sold out on a judgment in favour of St. Elkins, the counsellor-at-law for the company, he being president of the company at the time, the sale of the total property (real estate) was announced by the sheriff for Dec. 16, and was carried out on Dec. 23, for a judgment amounting to \$11,702.81 and \$620.84 costs, and knocked down at \$16,479, leaving, if not also swallowed by the lawyers, \$4155.35 for the bondholders, who hold bonds to the amount of \$4,799,500 and coupons for several years, and for the stockholders holding a nominal capital of \$5,000,000 nothing. Mr. John Collinson, of London, although holding most of said stock, has, I believe, derived the largest profits of the entire transaction, and with him U.S. Senator Chaffee and others mentioned in my former report. This makes me remember that the *Mining Journal* published on July 1 had an anonymous article—Why Investments by Foreign Corporations in American Mines fail to become profitable—copied from the *Denver Mirror*, which anonymous article was, as I believe, written by the man who, by his alleged connection with the concern perpetrated on the Hollanders, made American mines appear identical with swindles on the European continent. The *Journal* has thus been mystified, and should serve to its readers the documents with regard to the same matter as they are contained in the *Mining Reviewer* of May 29, which I forward herewith.

The first article referred to thus concludes:—The Caribou mining property, sold at its true value, developed with a reasonable working capital under the administration of a practical silver mining captain, on whose sound sense and good judgment the financial agent can rely, who will not mislead the shareholders with millions in sight, thereby starting wrong and dishearten and disgust everyone connected with the business, when millions, or thousands and thousands are not forthcoming, and the property, free from debts and strife, will unquestionably prove very valuable. Should the Caribou mine and mill be sold or change hands, it is to be hoped, for the interest of the new owners as well as for Caribou district and Boulder county, that a sensible, practical silver mining captain will get the management of the Caribou mine,—start right, keep right, rather understate the production of the ore, and figure a little higher on the expenses; for my sad experience as financial agent has been that at the end of the month the ore promised to be delivered has always fallen short in quantity, and the pay-rolls and expenses were always higher than estimated by the mine superintendent at the commencement of the month. Therefore if a good business man says, in regard to silver mining, that it is simply a question of arithmetic whether it can be made to pay, then the first duty of the mining captain is not to overstate what is in sight, nor to understate the expenses, because these delusions, looking splendid on paper, must and shall always practically end in disappointment and grief; but if a capable silver mining captain, not trying to mislead his men nor the public by erroneous statements, will attend strictly to his business, adding to this business tact integrity and fewer newspaper articles, he will unquestionably make a great success of the Caribou mine, which is undoubtedly a rich silver mine.—H. J. DE BRUYNE, Chief Agent Mining Co. Nederland.

That case with the Maxwell Grant and Emma are characteristics for the international business intercourse, and deserve to be well known in all their details. The editor I mentioned in my last letter has not met the fate he merited. There is too much of Tilden expectation in the air for it, and the sentence has been commuted to ten years in the penitentiary.

Since my last report I have travelled along the Menzanas mountain range on its east side, leaving the San Pedro and Isidro Mountains north, and the Sandia north-west. Nature in these mountains is very primitive, and riding on horseback along some forest trails I found fresh bear tracks, 5 in. in width, in the snow of the previous night, showing that hunters would be better in place here even than miners. When mentioning this fact, I heard that a few weeks ago two of the kindred, of younger age, paid a visit to the village of Galliste, west of the old placer mountains, and were caught and killed by some Mexican boys.

Menzanas Mountain Range, unlike the Sandia, slopes gently on its east side, and is covered with magnificent pine timber on the even slopes. This occasions an abundance of water and springs and, in

consequence, of settlements along the range. Chilili and Menzanas are good sized villages, and well off on account of rich crops of maize and wheat. Abo, an old Indian pueblo, with large church ruins, but now inhabited by Spanish descendants only, is situated in the only pass for the Rio Grande Valley all along the Menzanas mountain chain. Here I found the first indication of useful mineral deposits since I left the Puerto Mountains, a stratum of conglomerate very coarse in its lower part, and resembling sand rock in its upper part, carries largely melancite (oxide of copper), but not in its earthy variety, but in solid globules from the size of a pea to a walnut or coconut, of a scaly structure and metallic lustre. The stratum is overlaid by a hard sand rock, which, after the conglomerate has crumbled under atmospheric influences, covers its outcrop with huge boulders. But the crumbled material shows the pebbles of melancite scattered over large areas in the shape that meadow iron ore occurs. As yet no copper ore is gathered, and none made available, but when I showed to the natives how speedily they could gather 5 lbs. of it, and told them it valued at about 8 c. per pound on the premises, they seemed to become enthusiastically determined to work on the copper placers. At some future time the conglomerate will be worked largely in the Abo Pass, because it crops out for many miles, and shows copper wherever I could see it, and I remained several days about the place to ascertain its extent. On the west side of the Sandia and Menzanas Mountains flows the Rio Grande, 8 to 10 miles distant from the mountains, which on the river side form precipices showing granite below, and topped with strata among which I recognised none older than the permian, the cretaceous being predominant. The Rio Grande Valley is fertile and well populated. Grapes and wine are produced on a large scale at the little towns of Bernalillo, Albuquerque, and Las Lunas, as well as in the Indian pueblos of Sandia and Isleta.

Las Lunas, N. Mexico, Feb. 7. F. M. F. CAZIN, Consulting Mining and Civil Engineer.

OUTLINES OF GEOLOGY—No. V.

THE TERTIARY STRATA.

SIR,—These beds were in earlier times thought to be of limited extent; they are now known to be of considerable thickness, and to consist of a variety of deposits, either marine, fresh water, or estuarine. They occupy less areas and are less consolidated than the secondary strata, and contain fresh and salt water fossils, or an admixture of these, as may be supposed from the different agencies at work in the deposition of the beds. The tertiary strata lie generally unconformably on the secondary—that is, the chalk or other secondary strata may have been subject to denudation, and may dip at a different angle to the overlying tertiary deposits. The south-east part of England is overlaid more or less by tertiary strata, some parts having been upheaved, and afterwards subject to denudation, giving rise to limited areas or basins, as found in England at present. There is a similar basin around Paris. Other tertiary deposits are found in Belgium, Auvergne, Spain, Austria, Hungary, and Italy. Deposits have also been recognised in North America and in India as tertiary. The rocks composing the tertiary system consist of alternations of sandstones, clays, limestones, marls, and lignites; the limestones and sandstones in some cases are hard and compact, in others loosely aggregated.

The tertiary or cainozoic system is divided into eocene, miocene, and pliocene, so named according to the number of species of its fossils found in the several divisions. The eocene strata contain fossils about 5 per cent.; the miocene, 25 to 40; and the pliocene, from 70 to 90 per cent. of existing species. The following are the strata of the London and Hampshire basins:—

Upper eocene.....	Hampstead series.
	Bembridge series.
	Osborne series.
Middle eocene, Paris basin	Headon series.
	Bagshot series.
	London clay.
Lower eocene	Plastic clay.
	Thanet sands.

The aggregate thickness of these beds is about 2500 ft., the Bagshot series alone being about 1200 ft., and the London clay, or Bognor series, about 480 ft. The plants that grew in the eocene period indicate a much warmer climate than now prevails in England at least; this may have been caused by the flow of ocean currents, by the direction of prevailing winds, and by the disposition of sea and land. The lignites of Europe, Asia, North America, and New Zealand are each associated with its peculiar character of plants, assimilating in some degree to the existing plants in those countries. The fossil remains consist of foraminifera, actinozoa, bivalve and univalves; cephalopods, a few; echinodermata, annelids; crustacea, a few; fish, great numbers; reptiles, birds, and mammalia. The brachiopods seem to have become extinct in the upper eocene period. The mammalia belonging to a later part of the period are the paleotherium, anoplotherium, lephiodon, anthracotherium, charopotamus, adapis, and the smaller microtherium.

THE MIOCENE BEDS.—There are no rocks known in Britain as representing these beds; they are known, however, and classed as a separate series in France, Belgium, Germany, Switzerland, Italy, North America, and India. The life of this period includes some gigantic animals, as the dinotherium and mastodon.

THE PLIOCENE BEDS consist of two groups in Britain—

- 1.—Red rag, about 50 ft. in thickness.
- 2.—Coralline rag, about 40 ft. in thickness.

The coralline rag consists of soft marly sandstones, with some bands of limestone, not coral, as its name implies. The red rag consists of red sandstones and gravel, and not always regularly stratified. The life of this period consist of foraminifera, actinozoa, polyzoa, brachiopoda (one species), bivalve and univalves, echinodermata, and mammalia. The pliocene is very limited in extent; patches of it are traced in Normandy, Italy, and South Russia.

There is evidence of considerable volcanic disturbance in the tertiary period, in the crater-like hills, and in some cases interstratification of lava. The overflow of lava is seen in the hills of Auvergne, in Italy, Hungary, Greece, Asia, Australia, and New Zealand; in Ireland, in the basalts of Antrim, and in Mull.

A great variety of lignites are found in the tertiary, from coal much resembling the true coal, to brown coal, and a peaty material, in Europe, North America, India, and New Zealand.

We now come to the succeeding period, the pleistocene, which is developed in the neighbourhood of Norwich, and called mammaliferous rag; this consists of beds or deposits of sand and gravel, containing shells of marine and fresh water origin, bones of mammalia, as those of the mammoth and mastodon. After the eocene period the climate seems to have become gradually colder until the advent of the glacial period, when the deposition of the northern drift or boulder clay took place, the boulder clay being a deposit of brown clay, sometimes 60 ft. or more in thickness, with large water-worn pieces of granite, whinstone, and sandstones interspersed through it. The drift extends over the lower parts of Ireland and Scotland, and the northern part of England, to Cambridge and southward of it. The boulders are derived from regions northward; those found in great quantities in Lancashire and as far as Gloucester have evidently been derived from the rocks of Cumberland or Westmorland. The boulders of shap granite are found in the low grounds of Durham and Yorkshire to the coast, some imbedded, others loose on the surface. The plains of Germany are in a similar way covered with drift; the boulders—some of them of immense size—are supposed to have been derived from the rocks of Scandinavia, to have been carried in ice over the Baltic, and deposited in the seas then existing in Central Europe. Since the glacial period there has been an elevation of those seas and other parts of Europe. England may then have been united to France and the Continent, the channels now dividing them having been caused by the action of the sea. After this elevation of the sea we arrive at the cave period; the caves of the Continent and Britain were inhabited by wild animals, as the hyena, bear, &c. Submarine forests and peat beds probably belong to this same period; many instances occur of such along our coast, as at Hartlepool and Redcar, which are sometimes laid bare in certain states of the tides.

In the tertiary periods we have noticed in the fossils the gradual

Capt. THURDAY, Redruth.—I have noticed in the *Mining Journal* your excellent reply to Mr. Granville Sharp. You are quite right, those who know you have confidence in you.—WM. JARDINE: *London, Feb. 26.*

Now, I would like to know what Mr. Granville Sharp has to say to me after that, for it strikes me there can be no other open to him but to withdraw his remarks, and to offer me an apology. With regard to my having lost over 100,000*l.* in the mine that is not strictly accurate; that that amount of money has been laid out on the mines (some of it before I came here) is undoubtedly true, but then the mines may be, and probably are, worth quite as much money now, consequently it has not been lost. Mr. Granville Sharp's last paragraph I ought not find fault with, as he gives me credit for greater ability than I ever dreamt of possessing. Turning to gold, however, ought not to be so very difficult an operation as puzzle me as to a man: the doing what so many modern alchemists

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and valuable property would be laid open. He thought the Bridge lode ought to receive attention.

The SECRETARY remarked that practical authorities said the Bridge lode was the best in the set, and in reply to shareholders stated that he believed there were 25 fms. to drive from the end of the cross-cut to the Bridge lode, 35 fms. having already been driven, but much little had been deposited in this cross-cut by the old workers, and would have to be cleared away. He could not find any record of the price paid for driving the end. He might mention that they would have to erect another drawing engine, as theirs had been in use 25 years, and was worn out, so that they were liable to a break-down at any time, or to endeavour to dispense with steam altogether, by making a spare water-wheel available for hauling purposes. If this could be done it would make a difference of 400 per month.

Mr. ROSEWATNE thought this was a matter that had better be left in the hands of the committee and secretary, and he settled by them after consulting with the engineers who would have to do the work.

It was then proposed by Mr. POWELL, and seconded by Mr. ROSEWATNE, that seeing that the prospects of the mine justify the shareholders in continuing the present vigorous development of the mine, a call of 2s. per share be made.

The call was unanimously agreed to, and the usual complimentary votes having been passed the proceedings terminated.

GREAT WHEAL VOR UNITED MINING COMPANY.

At a special general meeting of adventurers held at the offices of the company, Gresham House, Old Broad-street, on Monday (Mr. JOHN O. HANSON in the chair), Mr. J. JAMESON TRURAN read the following report:—

Since the special meeting on Feb. 8 we have continued the driving of the cross-cut south at the 100 fm. level, which is now driven 3 fms. 4 ft. south of the lode; when about 16 ft. we intersected a small branch running parallel with the lode, but its underlie not so much; therefore there is no chance of it uniting with the lode at a deeper level: it is composed of black capel similar to the lode, but contains no blint. Our development at this level, although limited, has quite satisfied me that in order to find tin in paying quantities deeper sinking is required, and I could not advise the spending of money at this or in the shallower levels.

It was then resolved that the resolutions proposed at the special general meeting of adventurers, held on Feb. 8, be confirmed, and that the committee be requested to accept the sum of 50 guineas as the remuneration for their services in winding-up the affairs of the company.

For remainder of Meetings see to-day's Journal.]

Registration of New Companies.

The following joint-stock companies have been duly registered:—

WALLACEY BRICK AND LAND COMPANY (Limited).—Capital 30,000, in 50 shares. To acquire and work beds of clay, sand, and other minerals, and to carry on the manufacture of bricks and tiles. The subscribers, who take 50 shares each, are:—P. Isherwood, Egremont, gentleman; James Ridelhalgh, Liskeard, builder; J. Looney, Newington, estate agent; T. V. Burrows, Egremont, builder; H. Crellin, Sandpark Park, Liskeard; G. Henderson, New Brighton, Oneshire, contractor; J. Ellis, Seacombe, contractor. The directors are:—Messrs P. Isherwood, J. Ridelhalgh, T. V. Burrows, H. Crellin, G. Henderson, and John Ellis, the qualification being the holding of 50 shares.

KENSINGTON GORE MANSIONS (Limited).—Capital 250,000, in 100 shares. To erect mansions at Kensington, &c. The subscribers are:—H. Godolphin Osborne, Chapel-street, Park-lane, 25; William T. Raymond, 32, St. James's street, 25; D. B. Johnson, Edinburg, Kent; L. Gasquet, 21, Victoria-lane, 25; C. Gasquet, 25, Queen-street, Chelsea; C. H. Driver, 5, Woodlands-lane, 25; C. H. Sier, Carr, 1, BOWING'S PATENT FILTER PRESS COMPANY (Limited).—Capital, 50,000, in 50 shares. To acquire a patent for a filter press, and to carry on the manufacture of the same. The subscribers are:—T. E. Peakes, The Priory, West Moulsey, 200; John E. Gray, Windham Club, W. 100; J. Davies, Blaen Marland House, Pembroke, 100; T. W. Hobson, Collingwood Works, Blackfriars, 200; T. G. Howell, 18, Great Winchester-street, 200; John Ward, 2, St. Michael's House, Cornhill; John Bowring, 2, St. Michael's House.

MOSAIC TILE COMPANY (Limited).—Capital 10,000, in 50 shares. To acquire patent rights in connection with mosaic tiles. The subscribers are:—J. B. Langley, 50, Lincoln's Inn-fields, 10; J. Fletcher, 7, Zakenham-street, 10; C. M. Shaw, 20, Catherine-street, 8; J. Johnson, 148, Goswell-road, gas engineer; W. F. Robinson, 4, Canonbury-road, N. 5; Thomas Horton, 40, Ledbury-road, Bayswater, 5; William Elgood, 48, Lincoln's Inn-fields, 5.

IVENGHOE AND HORTON BRICK AND TILE COMPANY (Limited).—Capital 10,000, in 50 shares. To carry on business as manufacturers of bricks and tiles. The subscribers (who take one share each) are:—W. Paseton, Little Gaddens, Haris; E. Browning, 8, Martin's, Stamford; A. Northen, Hazlehurst, South Norwood Hill; R. A. Gibbons, Northfield; H. C. Brown, 7, Westminster Chambers; Joseph Robinson, 7, Lawrence Poutney Hill; C. Denham, 24, Coal Exchange, E.C.

ELTERWATER WATER-GREEN SLATE COMPANY (Limited).—Capital 30,000, in 100 shares. To acquire the lease and work quarries and beds of slate, flag, stone, &c., within and under certain lands at Elterwater, and Great and Little Langdale, Westmoreland, belonging to the trustees of the will of the late J. Robinson and Benson Harrison, and also to Lord Muncaster, according to an agreement made between J. F. Green and Isaac Williams. The subscribers are:—Thos. Bell, Ambleside, chemist, 200; Isaac Williams, Ambleside, mining agent, 50; W. Lester, Ambleside, bank manager, 70; George Armstrong, Ambleside, gentleman, 80; W. H. Heelis, Hankshead, Lancashire, solicitor, 50; James Bell, 24, Cross-street, Manchester, stockbroker, 250; W. F. Sim, 7, Lawrence Poutney Hill, 1. The directors are:—Messrs J. F. Green, W. F. Sim, Thomas Bell, and James Bell, the qualification being the holding of 100 shares.

BRICK AND STONE COMPANY (Limited).—Capital 60,000, in 250 shares. To carry on business as quarry owners, stone merchants, brickmakers, marble merchants, &c., and to acquire various contracts and properties according to an agreement between Thomas Herdman and James McMillar of the one part, and William Hedley and Thomas Galloway for the company. The subscribers (who take 10 shares each) are:—Thomas Herdman, Strawberry House, Newcastle-upon-Tyne, merchant; Joseph Francis, West Blanford-street, Newcastle; W. Forest, Newcastle, agent; John McMillar, Gateshead; William Hedley, Jarroon on Tyne, ironmonger; Thomas Galloway, Newcastle, confectioner; James Eltringham, Newcastle, accountant. Mr. Herdman will be the managing director. The qualification for ordinary directors is 10 shares.

BENJAMIN EVANS AND COMPANY (Limited).—Capital 30,000, in 100 shares. To acquire the drapery business of Mr. B. Evans, of Newport, Monmouthshire. The subscribers are:—Benjamin Evans, Newport, 100; John Gibbs, Newport, 50; Robert Jones, Newport, 100; John Wareham, Newport, 100; R. Rugs, Newport, 2; D. J. Rhys, Neath, 10; and B. Evans, Swansea, 5.

TRAFALGAR INVESTMENT ASSOCIATION (Limited).—Capital 20,000, in 500 shares. To carry on business as a land and building society. The subscribers are:—W. Bailey, 105, Commercial-road, 1; H. D. Davies, Little Blakenhall, Warrington, 2; A. Johnston, 15, Penryn-place, South; J. F. Stanley, Austinfriars, 1; H. T. Jones, 118, Chesapeake; George Brown, 141, Bow-road; Thomas Smith, 85, Bow-street, 1.

ELECTRIC WRITING COMPANY (Limited).—Capital 20,000, in 200 shares. To acquire the business of the Electric Writing Company, of 9, New Broad-street. The subscribers (who take one share each) are:—J. Royce, Middlesbrough; H. J. McCulloch, 178, Gresham House; J. R. Breckon, Sunderland; James Morrell, 353, Oxford-street; T. W. Breckon, Blakeney; J. Raine, 20, Holmside, Sunderland. W. Spencer, Newcastle-upon-Tyne.

CHESTERTON COAL AND IRON COMPANY (Limited).—Capital 200,000, in 1200 shares, of which 57 1/2% will be credited as paid. To work for coal, clay, and other minerals at Chesterton, parish of Walsington, Stafford, and to acquire the business of the Chesterton Company (Limited), according to an agreement made between A. E. Wenham and John Topham, the liquidators of the old company, and the said company of the one part, and J. T. Thorneycroft of the other. The subscribers are:—John Topham, Middlesbrough, gentleman, 1; J. P. Gardner, Cannock, Stafford, 1; E. C. Peake, Rugeley, colliery proprietor, 1; D. H. Monckton, M.D., Rugeley, 1; L. Lander, Rugeley, solicitor; Thos. James, Rugeley, bookseller, 1; H. C. P. Wall, mining engineer, 1; J. A. Lyster, Inland Revenue, 10; James Finlay, J. P. Gardner, R. Lander, John Topham, and three others to be appointed by them. The qualification is the holding of shares to the value of 1000.

LANCASHIRE COAL COMPANY.—Capital 20,000, in 100 shares. To acquire from C. G. Mott the business carried on by him at Birkenhead under the style of the Lancashire Coal Company, according to an agreement made between himself and Hugh Powell. The company will carry on business as coal owners and miners, &c. The subscribers are:—R. C. Johnson, 11, Dale-street, Liverpool, coal merchant, 50; W. M. Lightfoot, York Villa, Chester, gentleman, 5; H. Pugh, Transmere, 100; J. W. Davies, 10, Cook-street, Liverpool, accountant, 10; B. Thorneycroft, 27, South-lane, Liverpool, gentleman, 10; H. H. Mott, 35, Hamilton-square, Birkenhead, wine merchant, 10; Thos. Dunnott, 5, Harrington-street, Liverpool. The offices of the company will be at Birkenhead. The directors are not yet appointed.

MORLEY VICTORIA QUARRY COMPANY (Limited).—Capital 60,000, in 50 shares. To work for and sell stone at Morley, Yorkshire. The subscribers are:—Josiah Rhodes, Morley, York, machine maker, 80; F. F. Smith, Morley, joiner, 8; George Hurst, Morley, quarrymaster, 6; James Brown, Morley, agent, 10; George Johnson, Morley, builder, 8; H. Broadbent, Morley, 12; J. Wilkinson, Morley, overlooker, 10. The directors are not yet appointed.

SWEDISH RAILWAY EQUIPMENT COMPANY (Limited).—Capital 50,000, in 100 shares. To construct railways and other public works in Sweden. The subscribers are:—Christopher Wegelin, M.P., 57 1/2, Old Broad-street, 10; George Wythes, Bickley Park, contractor, 10; Robert Fletcher, 3, Lothbury, 10; Arthur Eden, 57 1/2, Old Broad-street; W. P. White, 57 1/2, Old Broad-street; H. L. Bichhoffshelm, 31, Throgmorton-street, 10; G. A. Barnes, 12, Sandcroft-terrace, Dulwich, 1.

JOSEPH HALLIDAY AND CO. (Limited).—Capital 20,000, in 50 shares. To acquire patent rights in connection with a self-cleaning filter, &c. The subscribers, who take 1 share each, are:—Joseph Halliday, 148, Bury New-road, Rochdale; J. E. Gibbs, Saleham House, Rochdale; D. Butterworth, Southport; M. Ashworth, Rochdale; H. Chadwick, 39, John-street, Rochdale; S. Bannick, Rochdale; W. Ashworth, Duke-street, Rochdale.

CIVIL SERVICE MEAT SUPPLY ASSOCIATION (Limited).—Capital 150,000, in preference shares of 5s. and ordinary shares of 2s. To carry on business as butchers, pateros, &c. The subscribers are:—J. D. Shakespeare, J.P., 7, Saville-row, 10; G. H. Armstrong, H.M. Customs, 10; A. C. Lyster, Inland Revenue, 10; H. J. Maclean, 9, King's-road, Bedford-row, 10; W. D. Young, clerk in the Post Office, 10; H. Hill, clerk, India Office, 10; C. H. Pontel, clerk, Post Office, 2.

NEW ZEALAND.—The Taranaki News states:—We are informed that the Government have received information that the Upper Wanganui natives are in a state of great excitement, owing to reports of people being out prospecting for gold and coal, and that they are on the look-out for prospectors.

A telegram in the New Zealand Times states that another rich lode has been struck in the Belmont Rangitoto silver mine, 9 ft. below the present working, which gives an assay of 240 ounces to the ton. A large reef, 10 feet thick, of porphyry quartz impregnated with silver, has also been discovered on the company's lease

a quarter of a mile from the present working. The reef has been driven on for a distance of 16 feet. The company have 366 feet of tunnelling in, and are prepared to stoop out hundreds of tons of ore.—*Sydney Morning Herald*, Jan. 12.

THE SCOTCH MINING SHARE MARKET—WEEKLY REPORT AND LIST OF PRICES.

During the past week the market has been very quiet, and no special feature to notice. In shares of iron and coal concerns Ebbw Vale has advanced 7s. 6d. per share, and Arncliffe 2s. 6d.; while Shotts have fallen 20s.; Bolckow, Vaughan, A. 5s.; Marbella, 3s. 6d.; Lochore and Caplethrae, Omoa and Cleland, also Scottish Australian 2s. 6d. each. Andrew Knowles and Sons are at par to 10s. prem. (177. paid). Cardiff and Swansea, 40s. to 45s. Consett, 19s. to 19 1/2. Mersey, 20s. to 15s. dis. Pelsall, 10 1/2 to 9 1/2 dis. Scottish Australian, 37s. 6d., buyers. Sheepbridge, 6 to 5 1/2 dis. Staveley, A. 30 1/2 to 31 1/2 prem; ditto C. 90 1/2 to 91 1/2. West Cumberland, 11 1/2 to 11 1/2 dis. Workington Malleable, 14 to 16. The meeting of the Monkland Company will be held on March 20. The Benhar Company yesterday recommended the dividend for the last six months to be 6 per cent. which is the same as the previous one, and compares with 9 per cent. a year since; from this it would appear that the worst of the depression has been reached, if not as regards colliery companies generally, at least as regards this one in particular. At the Marbella meeting on March 6 a dividend of 3s. per share, payable on March 16, was declared. The M. Moxham case has been settled by payment to the Marbella Company of 17,000, and all law expenses. The sales of ore have not been very large, but there was a large stock on hand, with facilities for increased output.

In shares of foreign copper concerns the movements in prices continue favourable, Rio Tinto 7 per cent. bonds having advanced 35s., Tharsis 12s. 6d., Rio Tinto shares 10s., Huntington 1s. 9d., and Yorke Peninsula (ordinary) 1s. 3d. Yorke Peninsula (preference) remain at 20s. to 25s. Some business has been done in Puncuillo at 28s. 9d. and 30s. Copiapo are 12 1/2 to 11 1/2 dis. New Quebrada, 80s. to 85s.

In shares of home mines a little more business has been done. Glasgow Caradon has advanced 1s. Bampfylde are at 8s. 9d. to 10s. Cargill, 5 to 5 1/2. East Van, 8 1/2 to 8 3/4. Glenroy, 30s. to 40s. Glyn, 40s. 42s. 6d. Great Laxey, 20s. to 20 1/2. Killbreth, 20s. to 21s. 3d. Leadhills, 6 1/2 to 6 3/4. Medlyn Moor, 30s. sellers. Parys Mountain, 9s., buyers. Penruthral, 11s. to 12s. South Condurrow, 6 1/2 to 6 3/4. Tincroft, 19 1/2. Van Consoles, 57s. 6d. to 60s. West Tankerville, 30s. to 35s. Wheel Agar, 65s. to 75s. Wheel Grenville, 12s. 6d. to 17s. 6d. Wheel Kitty, 55s. to 60s. Wheel Ury, 36s. to 38s.

In shares of gold and silver mines, Last Chance are 10s., and Flagstaff, also Richmond, each 7s. 6d.—all lower. The Richmond run is 342,000, being 2000 better than previous week. It is said application will shortly be made for quotations and settlements of the Exchequer and I.X.L. Companies' shares on the Glasgow and other Scotch Stock Exchanges. Some business has been done in Almuda and Tiritto, at 7s. 6d., closing 5s. to 7s. 6d. Chicago are at 80s. to 90s.; Eberhardt and Aurora, 8s. to 9s.; Emma, 7s. 6d. to 10s.; St. John del Rey, 280 to 300; Santa Barbara, 32s. to 40s.; South Aurora, 6s. 3d. to 7s. 6d.

In shares of oil concerns, Young's Paraffin has recovered 16s. 3d.; Uphall, 10s., and Oakbank (new), 6d., but Oakbank have fallen 1s. Runcorn Soap and Alkali are at 57s. 6d. to 47s. 6d. dis.

Shares of miscellaneous companies continue a very slow market. Scottish Wagon (new) mark a reduction of 2s. 6d. Cheshire Almagamated Salt Works are at 14s. to 15s.; Earl's Shipbuilding, 22 dis. sellers; Langdale's Chemical, 77s. 6d. to 80s.; Lawe's Chemical, 64 to 65; Milner's Safe, 9 1/2 to 10 1/2; Newcastle Chemical 85s. to 80s. dis.

Subjoined are this week's quotations, &c., of mining and metal shares quoted on the Scotch Stock Exchanges:—

Capital.	Dividends.	Rate per cent.	Description of shares.	Last price.
Per share.	Paid.	Previous.	COAL, IRON, STEEL.	
2 1/2	48	8 1/2	Arncliffe (Limited)	7 1/2
10	10	9	Benhar Coal (Limited)	9 1/2
10	10	9	Ditto	7 1/2
100	45	35s.	Bolckow, Vaughan, and Co. (Lim.) ..	52 1/2
10	10	10	Calnaithe Gas Coal (Limited)	8
10	10	10	Chillingstone Iron (Limited)	82s. 6d.
32	29	10	Ebbw Vale Steel, Iron, and Coal (Lim.) ..	9 1/2
10	10	10	Effe Coal (Limited)	50s.
10	10	10	Glasgow Port Washington Iron & Coal (L) ..	50s.
10	10	10	Ditto Prepaid	50s.
10	10	10	Lochore and Caplethrae (Limited)	6 1/2
10	10	10	Marbella Iron Ore (Limited)	74s.
10	10	10	Monkland Iron and Coal (Limited)	55s.
100	100	10	Ditto Guaranteed Preference	5
10	10	10	Nant-y-Glo & Blaen Ironworks pref. (L) ..	20 1/2
6	5 1/2	10	Omoa and Cleland Iron and Coal (Lim.) ..	32s. 6d.
1	1	12 1/2	Scottish Australian Mining (Limited) ..	49s.
1	1	12 1/2	Ditto New	10s.
Stock	100	5	Shotts Iron	99

Capital.	Dividends.	Rate per cent.	Description of shares.	Last price.
Per share.	Paid.	Previous.	COPPER, SULPHUR, TIN.	
10	10	10	Canadian Copper Pyrites (Limited)	17s. 6d.
10	10	10	Cape Copper (Limited)	40
1	1	15s.	Glasgow Caradon Copper Mining (Lim.) ..	2s.
10	10	10	Huntington Copper and Sulphur (Lim.) ..	15s. 3d.
25s.	33s.	10	Kuondu Mining (Limited)	15s. 6d.
4	4	10	Panicoito Copper (Limited)	30s.
10	10	10	Rio Tinto (Limited)	5
20	20	10	Ditto, 7 per cent. Mortgage Bonds ..	15 1/2
100	100	10	Do. 5 per cent. Deb. (Sp. Con. Bds.) ..	61
10	10	10	Russian Copper (Limited)	50s.
10	10	10	Tharsis Copper and Sulphur (Limited) ..	21 1/2
1	1	10	Ditto New	74s.
1	1	10	Yorke Peninsula Mining (Limited)	74s.
1	1	10	Ditto, 15 per cent. Guaranteed Pref. ..	21s. 3d.

Capital.	Dividends.	Rate per cent.	Description of shares.	Last price.
Per share.	Paid.	Previous.	GOLD, SILVER.	
1	1	10	Australian Mines Investment (Limited) ..	8s. 9d.
20	20	10	Emma Silver Mining (Limited)	10s.
10	10	10	Flagstaff Silver Mining (Limited)	65s.
5	5	10	Last Chance Silver Mining (Limited) ..	10s.
5	5	10s. 6d.	Richmond Mining (Limited)	6 1/2

Capital.	Dividends.	Rate per cent.	Description of shares.	Last price.
Per share.	Paid.	Previous.	OIL.	
10	10	10	Dalmeny Oil (Limited)	8 1/2
1	1	10	Oakbank Oil (Limited)	47s.
1	1	10	Ditto	12s.
10	10	10	Uphall Mineral Oil (Limited) "A"	9 1/2
10	10	10	Ditto "B" Deferred	10
10	10	10	Young's Paraffin Light & Mineral Oil (L) ..	13 1/2

Capital.	Dividends.	Rate per cent.	Description of shares.	Last price.
Per share.	Paid.	Previous.	MISCELLANEOUS.	
50	25	10	London and Glasgow Engineering & Iron Shipbuilding (Limited)	20 1/2
20	14 1/2	10	Peruvian Nitrate (Limited)	11 1/2
10	10	10	Scottish Wagon (Limited)	11 1/2
10	10	10	Ditto New	85s.

NOTE.—The above lists of mines and auxiliary associations are as full as can be ascertained, Scotch companies only being inserted, or those in which Scotch investors are interested. In the event of any being omitted, and parties desiring a quotation for them and such information as can be ascertained from time to time to be inserted in these lists, they will be good enough to communicate the name of the company, with any other particulars as full as possible.

J. GRANT MACLEAN, Stock and Share Broker.

Post Office Buildings, Stirling, March 8.

CHEMICALS, MINERALS, AND METALS.—(Messrs. J. Berger Spence and Co., March 6.)—Acetate of Lime, 9s. per ton.—Alumina, Alum, 15s. for loose lump; ground, 7s. 15s.—Aluminous cake, 4s. 10s.—Ammonia, Sulphate, grey, 18s. 10s.; best London white, 19s. 5s.; muriate—white, 28s.; grey, 27s.; sal ammoniac, firsts, 45s.; seconds, 44s.—Acid: Tartaric, English, ground or crystal, 1s. 7d.; foreign, 1s. 6 1/2d.; crystals, 1s. 6d.; sulphuric, 3s. 10s. to 3s. 15s.; picric acid, 1s. 9d. per lb.—Arsenic: New Consols make 9s. 7s. 6d.—Bleaching Powder: At 6s. 7s. 6d. for the whole of 1877, 6s. 15s. to 7s.—Litharge: Best flake, 24s.—Metallic Salts: Iron salts, green and rusty copras, 55s.; in casks or barrels, 60s.—Copper Salts: Sulphate of copper, 23s.—Magnesia: Epsom salts, 3s. 12s. 6d.—Nitrate of Soda: 12s. 6d. to 12s. 9d.—Potash: Muriates, 80 per cent. at 6s. 8s. 6d. f.o.b.; Prussiate, yellow, 11 1/2d.; chlorate, 9d.; bichrome, 4 1/2d.—Soda: Cream caustic, 60 per cent., 12s. 6s.; white, 60 per cent., 12s. 6s.; soda ash, 1 1/2d. to 2s.; soda crystals, 4s. 7s. 6d.; 14-carbonate, 11s.; salt cake, 3s.; Glauber salts, 2s. 17s. 6d.—Sugar of Lead: Brown, 26s.; grey, 31s. 10s.; white, 38s.—Brimstone: Best third, 5s. 17s. 6d.—China-clay: 15s. f.o.b. Cornwall; "Rosedillyn," 24s.; "B.M.," 34s.—Iron Ore: Hematite, 15s. to 22s. 6d.; Algerian, 53 per cent., 14s. f.o.b.—Manganese: Ores, 90s. for 70 per cent.—Pyrites: Spanish cupreous, 5 1/2d.; non-cupreous, 6 1/2d.—Phosphate of Alumina, 3s. to 3s. 10s. per ton.—Phosphates: High strength, 80 to 85 p.c., 1s. 4d. to 1s. 5d. per unit; Extremadura, 1s. 3d.; ordinary, 80 per cent., 1s.; precipitated phosphate of lime, 70 per cent., 5s. 15s.—Iron: "Ayresome" Middlesbrough Pig Iron, No. 1, 45s.; No. 3, 45s.; No. 4 (foundry), 44s.; No. 4 (forge), 43s. 6d. net.—Hematite, No. 1, 79s.; No. 2, 67s. 6d.; No. 3, 67s. 6d.; No. 4, 67s. 6d.; No. 5 (mottled and white), 65s.—Bessemer, No. 1, 70s.; No. 2, 67s. 6d.; No. 3, 67s. 6d., less 2 1/2

p.c., or four months' bill, net.—Scotch warrants, 55s. 6d.; Scotch, g.m.b., 5s. 1/2, 55s.; No. 3, 51s. 6d. net.—Copper: Chili bars, 75s.; B.S. ingot, 80s.; tough cast, 78s.—Lead: Best English soft pig, 21s. 10s.; German soft pig, 21s. 10s.; tough cast, or London—Spelter: Silesian, 20s. 10s.; English, "Swansea Vale," 22s.—Tin: Straits, 73s.; Australian, 72s.; British, 76s.—Tin-Plates: Best charcoal, 45s.; flat charcoal, 25s.; best coke, 23s.; coke, 22s.—Tubes and Fittings: Discounts on application.

THE COAL TRADE.

Mr. J. R. Scott, the Registrar of the London Coal Market, has published the following statistics of imports of coals into the port and district of London by sea, railway, and canal during Feb., 1877:

By sea.	Ships.	Tons.	By Railway and Canal.	Tons.
Newcastle	188	153,805	London & North-Western	110,400
Seaham	40	19,619	Great Northern	110,400
Sunderland	99	65,083	Great Western	61,300
Middlesbrough	4	1,005	Midland	110,400
Hartlepool	107	37,027	Great Eastern	110,400
Scotch	14	8,827	South-Western	44,000
Welsh	4	1,853	London, Chatham, & Dover ..	1,500
Yorkshire	30	1,833	South-Eastern	1,500
Duff	1	323	Grand Junction Canal	320
Small coal	21	5,233		
Cinders	9	2,335		
Colonial	1	50		
Total	520	294,149	Total	405,000
Imports—Feb. 1876	554	321,165	Imports during Feb. 1876	415,000

Imports—Feb. 1876	554	321,165	Imports during Feb. 1876	495,816
				495,810
Comparative Statement, 1876 and 1877.				
By Sea. Ships.		Tons.	By Railway and Canal.	
Jan. 1 to Feb. 29, 1876	1047	850,858	Jan. 1 to Feb. 29, 1876	892,200
Jan. 1 to Feb. 28, 1877	1077	846,800	Jan. 1 to Feb. 28, 1877	892,200
Increase	30	dec. 4,058	Decrease	

constructed, with all the latest European improvements. The first one will be in blast in about nine months, and the second, if required, could be ready in six months thereafter; the site has been selected in this case, as in others, with every care, allowing ample room for extension of works. These furnaces are being constructed with great economy, owing to the depression in trade, and by the payment of prompt cash the company has secured both labour and materials on most favourable terms. A foundry and fitting shops have been erected, and are now in active operation. The buildings are large, and the machinery and appliances powerful. Both departments are at present fully engaged on the company's own work, but are sufficiently extensive to admit of founding and engineering work being undertaken on an extensive scale at a future date.

At Victoria 200 coke ovens will be erected as soon as the bricks are ready. The machinery for the fire-brick works has been carefully designed and made in England, and is now being erected at Victoria. The fire-clay will be worked in conjunction with the coal. At Whitwell large and substantial baryta and saw mills have been erected; the former is just commencing work, while the latter is employed in preparing timber for the company's use at South Pittsburg. The deposits of baryta on the company's property are very extensive and valuable. The town of South Pittsburg has been laid out on a portion of the Battle Creek estate, the part laid out being three-quarters of a mile long, and half a mile wide, fronting towards the Tennessee river, on gently rising ground, has good natural drainage, and a plentiful supply of pure water from a source above the town, and the necessary works for the supply of water will have at once to be put in hand.

The climate is very healthy, and the scenery picturesque. For the convenience of the numerous workmen, a large general store has been opened here, with branches at Victoria and Whitwell. These are already doing a considerable business, and earning a fair profit. A temperance hotel, let to a respectable tenant, and doing a thriving business, also two boarding-houses, and a general manager's residence have been built, besides the store and other buildings previously named. The ensuing spring will, doubtless, see much building commenced. Altogether the company appears to have an excellent property, and from the position and experience of those entrusted with its management there are good prospects of its satisfactory development.

TREATMENT OF ARGENTIFEROUS PYRITES.

An important invention connected with the manufacture of salts of barium, and indirectly applicable to the extraction of silver from argentiferous pyrites, has been patented by Messrs. WALLACE and CLAUS, of Battersea and Great St. Helens; it relates in the first place to the production of hyposulphite of baryta, from which they produce the other hyposulphites by double decomposition with their respective sulphates. They first prepare sulphide of barium by heating the native sulphate with carbonaceous materials. Of this sulphide of barium they prepare a solution and inject into it sulphuric acid gas, obtained in any convenient manner—for instance, by burning sulphide of hydrogen in contact with atmospheric air, or from the roasting of pyrites, or by blowing a current of air over burning sulphur. To force the sulphurous acid into the liquid a blowing engine may be employed, or a steam injector. The effect of the sulphurous acid gas upon the sulphide of barium solution is the formation of hyposulphite of baryta, which precipitates in a crystalline white powder, which they separate from the mother liquor by filtration, and wash it with clean water. Mother liquor and washings contain a small quantity of hyposulphite of baryta in solution, and in order that this may not be lost they use the same for dissolving fresh quantities of sulphide of barium. The precipitate of hyposulphite of baryta after being drained they either dry and use it as such, or they use the same in the moist state for the decomposition of alkaline sulphates, or the sulphates of other bases forming soluble hyposulphites. For instance, the reaction just above described may be made of the most important use in the extraction of silver from roasted argentiferous pyrites. It is well known that hyposulphite of soda has a more than 20 times greater dissolving power for chloride of silver than the common salt usually employed.

In the process of chloridising or washing argentiferous pyrites—that is, in the roasting of pyrites with common salt—a quantity of sulphate of soda is formed, which enters into solution during the process of lixiviation with water. Into this liquor of the extracting vats, containing sulphate of soda, they mix an equivalent quantity of the hyposulphite of baryta; the sulphate of baryta formed is separated; the superabundant liquor containing the hyposulphite of soda is used for the extraction of silver by dissolving the chloride of silver in the ore. Native sulphate of baryta being almost invariably found near metalliferous deposits, and the sulphurous acids being readily obtained from wasting of pyrites, the cost of the use of hyposulphite of baryta is actually less than that of common salt; besides this, it does not foul the liquors so soon as the salt does. In preparing commercial hyposulphites from the hyposulphite of baryta the sulphates are mixed with the latter in equivalent quantities, the sulphate of baryta formed is washed and filtered off and used as pigment, whilst the filtrate is boiled down and crystallised in the usual manner, such as, for instance, hyposulphites of soda. As to the other hyposulphites, such as that of alumina, zinc, and the like, also used in the arts, these may be employed in the manner most convenient for the purpose.

The invention will also be interesting to miners from its being likely to create an increased demand for barytes, since it includes the manufacture of precipitated carbonate of baryta and chloride of barium from materials not hitherto used for that purpose, and the employment of which makes the production possible of these salts at a very low cost, so that the same may be employed for purposes from which their cost of production now excludes them. They prepare carbonate of baryta by precipitating it by means of carbonate of ammonia or gas liquor from solutions of sulphide of barium. The precipitate is washed with water, filtered, and dried, this drying being effected in closed vessels (preferably by steam), in order to collect and absorb the sulphide of ammonium given off by sulphuric acid. The carbonate of baryta obtained is useful, for instance, for the manufacture of cheap flint glass (it being free from iron), or as a glaze for pottery ware.

The filtrate consisting of a solution of sulphide of ammonium they distil by means of steam, as in the ordinary gas liquor, and the volatilised sulphide of ammonium they convey into sulphuric acid or hydrochloric acid, whereby sulphide of hydrogen is liberated and sulphate or chloride of ammonium is formed. The sulphide of hydrogen given off they convey into a burner (with the necessary precautions against explosions), and burn the same in combination with atmospheric air into sulphuric acid, which they convey into the sulphuric acid chambers for the manufacture of sulphuric acid therefrom, or they employ it for injecting into solutions of sulphide of barium for the manufacture of hyposulphite of baryta. Or they concentrate the sulphide of ammonium filtrate by distillation at the most suitable temperatures (in the manner known to manufacturers, and now practised with weak carbonate of ammonia solutions), pass sulphurous acid gas, which may be diluted with air or other gases, through the same, whereby they obtain some sulphate of ammonia, but also considerable quantities of hyposulphite of ammonia. This liquor they decompose by sulphuric acid for the purpose of manufacturing commercial sulphate of ammonia therefrom. Free sulphur is then separated, and they collect and melt the same into cakes, and sulphurous acid gas is given off, which they convey into the lead chamber for the manufacture of sulphuric acid. This sulphurous acid gas being unmixt with other gases, and containing already two equivalents of oxygen in combination, and only requiring one more to form sulphuric acid, enables the chambers to produce three times the quantity of sulphuric acid in the same cubic space.

By decomposing the hyposulphite of baryta obtained, as described with carbonate of soda, Messrs. Wallace and Claus also manufacture carbonate of baryta and hyposulphite of soda, and they also claim the manufacture of chloride of barium by heating the refuse resulting from the manufacture of acetic acid from acetate of lime and hydrochloric acid (and which consists principally of chloride of calcium and tarry matter), together with native sulphate of baryta

and carbonaceous materials. By this operation chloride of barium is formed, which dissolves out readily with water, leaving behind undissolved sulphide of calcium, similar to that forming alkali waste in the manufacture of alkali. If the solution should contain any sulphur compound they destroy the same by the action of chlorine on the same, but generally there is very little sulphur in the solution. By lixiviating the flux with hot water a solution may be obtained strong enough for crystallisation. If cold water be used for lixiviating the liquor is boiled down and crystallised by cooling. The mother liquor they use for dissolving fresh quantities of the crude chloride of barium. Any sulphur compounds present in the liquor may also be destroyed by gently heating or calcining the crude crystals of chloride of barium and re-dissolving and re-crystallising them.

IMPROVEMENTS IN BLAST-FURNACES.

With a view to provide increased facilities for regulating or directing the hot-blast supplied to blast-furnaces, to diminish the liability of the apparatus to injury or deterioration from the effects of the hot-blast, to ascertain when any part of the apparatus is deranged or not in proper working order, and to effect necessary repairs without impeding, interrupting, or impairing the working of the furnace, Mr. D. G. HOEY, of Workington, Cumberland, proposes to provide a main pipe to encircle or surround the furnace and receive the branch pipes leading from the different heaters, which pipe is divided into sections by means of valves, which in the ordinary working of the apparatus remain closed, so that each heater supplies its own corresponding tuyere. Each of the branch pipes is fitted with a valve near the heater, and with another valve near the furnace, the encircling main pipe being situated between these two valves, both of which during the normal working remain open. When, however, any heater is observed to be even slightly out of order it can be isolated by closing the valve near to the said heater, whilst by opening one or more of the valves in the main pipe the blast will continue to pass into the tuyere without any interruption. The valves arranged in the branch pipes near the furnace are so constructed that when the pipe leading from the main pipe to any tuyere is out of order it is isolated from the main pipe by closing its valve, and the supply to the tuyere is continued as before through an auxiliary pipe, which he attaches when required, a suitable flange being provided in the main pipe opposite each tuyere room for the purpose. When also it is suspected that water is escaping into the furnace at any tuyere it can be ascertained by closing its valve and withdrawing the ordinary plug, when a portion of the blast from the other tuyeres will be ejected through the aperture, and the presence of the least moisture will be detected. Between each heater and its adjacent valve he places a cock, so that when a heater has to be re-heated after repairs it can be brought up to its normal temperature with perfect safety by allowing the blast to pass through the heater and escape through the said cock into the atmosphere, the extent of such escape being regulated by adjusting the degree of opening of the cock. This cock is so constructed as to admit of a pyrometer being applied thereto in order to test the temperature of the air and ensure the required degree before the valve is opened for directing the blast from the heater into the furnace.

Where heaters are divided into two or more compartments through which the blast is successively conducted Mr. Hoey fits in connection with each of the compartments a cock of a similar description and performing a similar function to the cock before referred to, so as to ascertain the degree of heat in each compartment. He further regulates the working of the several compartments by combining with the use of the ordinary exit valve or damper employed between the heater and the exit flues a sliding door or valve at the fire end or entrance, by adjusting the degree of opening of which the heat may be caused to pass more or less into the different compartments. He also protects the pipes at the hot end of the heater by means of an air chamber formed between the said pipes and the ordinary protecting brickwork, through which chamber a current of cool air (admitted from the external atmosphere) is caused to constantly pass, such current being conducted either by a direct or a circuitous course to the fire, so as to effectually prevent the pipes from being burnt by the heat impinging directly upon them. In the portion of the main pipe which is situated at the front of the furnace provision is made for an auxiliary tuyere, which may be used at or near the level of the other tuyeres, either continuously or as occasion may require, and either with the full power of the blast or with any lower degree which may be desired. He also so arranges the apparatus in connection with the auxiliary tuyere that in the event of the tapping hole becoming obstructed, or of the pot of the furnace getting deranged in its working, the blast may be directed at any level or angle in order to melt the obstruction either with or without the use of an external refinery or small furnace.

ATMOSPHERIC BRAKES.

The construction of the mechanical arrangement of the atmospheric brake invented by Mr. CHARLES COWDERY, of Montgomery, embodies several improvements of importance. Within the frame which supports the flooring of each carriage is fixed an air-pump, which is worked by an eccentric keyed to one of the axles of the carriage. This eccentric is made with an arm extending laterally from its periphery, the free extremity of which is connected by a link to the piston-rod of the pump, so that whenever the wheels are in motion the rotary movement of the eccentric works the piston-rod of the air-pump to and fro.

In the centre of this link is fixed a pin, or short rod, which extends laterally on both sides of the link. Above this pin is arranged a lever hung from a bearing fixed to the under side of the floor of the carriage or other convenient part, one end of which is made of a duplex or fork-like form, this part having notches cut in it so as to catch or hold the pin before referred to when required. The free end of this lever is, when required, acted upon by a second lever, which, when brought into operation, depresses the end of the lever, thus causing its other or forked end to be raised and so lifted clear of the transverse pin of the link, so that when the brake is not wanted the forked lever moves to and fro without working the air-pump.

Behind the air-pump there is arranged a receiving cylinder or air reservoir, which is fitted with a piston and self-acting valve, so arranged as to close at each return stroke of the air-pump. The air as it is pumped in is forced through the valve, and its pressure drives the piston forward, the rod of which being connected to the brakes they are actuated in a corresponding manner. Extending along the centre of the framing is a rod or shaft, which carries a heavy weight fixed to any convenient part of it. This rod has also fixed to it two cams or levers, one of which acts upon another lever, which allows the forked lever to fall and become engaged with the transverse pin of the link, and thus put the air-pump at work. The other cam or lever acts upon a second lever, which closes a valve in the receiving cylinder. To take the brakes off the guard or driver has merely to cause the longitudinal rod to make a quarter of a turn, which is done either by means of a wheel or lever arranged in any convenient position, and with a pawl or catch that takes into a notch, to keep the brakes off when they are not required.

To connect the brake system of the several carriages the longitudinal rod already mentioned is fitted at each end with a universal joint to allow for any difference of level or for any oscillation, and to one end of the rod a socket is fitted, having its extremity formed of a bell or trumpet shape. The other end of the longitudinal rod is formed of a spigot or wedge-like shape corresponding to the internal figure of the socket at the other end. In this way the carriages are most readily coupled up, the wedge end of one rod fitting into the socket end of the next carriage, and thus the several longitudinal rods form a continuous one throughout the train. These connections are so made that the carriages can only be coupled up when the brakes are in a like position on each carriage—that is to say, the brakes of the contiguous carriage must accord with the position of those on the carriage to be coupled up.

For use in station yards or where shunting is required there is fixed to each end of the carriage a small hand lever, by drawing down

which causes the brakes to be taken off. If found necessary in order to avoid the admission of sand or dust into the air-pump, the air may be supplied thereto by means of a tube or pipe carried from the air-pump up through the roof of the carriage, and fitted with a cowl that may be turned away from the engine to prevent the admission of ash or dust. The engine and tender may also be fitted with this brake, so that the engine-driver has also the power of instantly putting the brake on independently of the guard; and in this way any one of the guards or the driver may stop the train without signalling to the others, and thus effect a most important saving of time, and in the event of any part of the train breaking away the weights being released, act at once upon the brakes and bring them into action. The brakes may also be applied to ordinary road vehicles, and arranged so that the driver may be able to put on the brake when required by his foot or hand.

THE MINERAL RESOURCES OF VIRGINIA.

Although the mineral resources of Virginia have been very frequently referred to in the *Mining Journal*, the description of the State, its geology, soils, minerals, and general capabilities contained in the volume* just issued by the Board of Immigration will be interesting to a large number of readers. The mineral resources of Virginia are very great, though as yet mostly undeveloped. They comprise gold, iron, copper, lead, and zinc, semi-bituminous and bituminous coals; granite, limestone, marble, freestone, greenstone, and brownstone, bricks and fire-clays, glass sand, plumbago, manganese, gypsum, salt, &c. In Middle Virginia gold is found in a belt some 15 miles to 25 miles in width that runs for 200 miles through that section from Washington city to Halifax Court House. This is known as the gold belt of Virginia; it is composed of a series of granitic, syenitic, steatitic, chloritic, and other rocks peculiar to this section striking north-east and south-west with the belt, and dipping at high angles, or standing nearly vertical. Stratified with these are numerous veins of gold-bearing quartz, seams of magnetic, specular hematite, and other ores of iron, trap dykes, &c. The gold found in these materials varies in value from \$1.50 to \$1000 per ton; an average 100 tons from the surface downward is estimated as worth \$939.32. Assays of samples from the Franklin Mine, in Fauquier county, gave from 200 lbs. of materials from the vein, as an average value—in one sample \$46.40 of gold and \$1.48 of silver; in another, \$72.55 gold and \$0.41 of silver; while another gave but \$2.32 of gold. The mean value of the assays of 10 samples was \$24.44 to the ton of 18 cwt. Large numbers of mines have been opened along the "belt," notably in Fauquier, Culpeper, Spotsylvania, Orange, Fluvanna, and Buckingham counties, and from these and gatherings from the surface and soils, \$1,662,627 worth of gold had reached the United States Mint up to June 30, 1871. If the same skill and capital were employed in Virginia as in California, these mines, in the opinion of practical miners, would yield as well as those of that gold-bearing State. Silver is associated with some of the gold producing rocks mentioned, especially the chloritic slate. Copper pyrites is abundant in all the gold belt, and carbonate of copper is also found. The excellent character of the sulphurets of copper of this region is becoming known, and large quantities of this ore are now shipped from Tolarsville, in Louisa county; one sample gave 43 per cent. of sulphur and 5.89 of copper; and another 48.25 of sulphur, and 0.60 of copper, with 5.60 of silica.

Plumbago of good quality occurs in Halifax, Amelia, and other counties. Iron ores are found in great plenty, and the first successful furnaces in America were on the hematite beds of this section. In the gold belt are seams of specular iron ore from 10 to 15 ft. in thickness extending with the belt. Sulphuret of iron is very plentiful in the same range, and extensive deposits of brown hematite ores are well known, both in the belt and along its eastern border. Magnetic iron ores are found in thick veins in many localities, as in Buckingham, Spotsylvania, &c. It may be stated as a general fact that any section across the 200 miles of the length of Middle Virginia will embrace a dozen valuable seams of iron ore, including limonites or hydrous peroxides, magnetites, chromates, sulphurets, micaceous, specular, &c., where the ores are abundant and easily mined. The introduction of cheap coal now inaugurated will bring these into use. Prof. Rogers gives analyses showing the ore to be worth from 50 to 59 per cent. of metallic iron. Bituminous coal and natural coke are found in extensive beds in the triassic or new red sandstone, especially in the Richmond coal field portion, where the coal-bearing rocks cover 150 square miles of surface. This field has been longer known and worked than any other field in America, but never to the extent that the value of its coals would seem to justify. On the north of James river five seams of coal have been opened, varying in thickness from 2½ to 8 ft., giving an aggregate of more than 20 ft., as at the Carbon Hill. On the south side of the river at Midlothian three seams have been opened, varying in thickness from 4 to 40 ft., making from 50 to 60 ft. of coal. One of the seams on the north side from 2½ to 6 ft. thick is a natural coke (the coal having been coked by the intrusion of a trap dyke) known as carbonate; the other seams are coking coals highly bituminous. In the last edition of his "Coal Fields of Great Britain" Prof. Hull states that the Richmond coal field contains several beds of valuable coal, one of which is from 30 to 40 ft. in thickness, highly bituminous, and equal to the best coal of Newcastle. These mines are admirably located for commercial purposes, and the coals are highly commended by all who have used them. The carbonate, or natural coke, is described as a material admirably adapted for stoves, having a high heating power, and containing very little ash or sulphur.

The ores of the Blue Ridge are copper, more or less the whole length of the range, as carbonates, sulphurets, &c., chiefly in the latter form. In Floyd, Carroll, and Grayson a dozen mines were once opened and several thousand tons of ore yielding 6 to 30 per cent. of metal were sent to market. Professor T. S. Hunt, at the 1872 meeting of the American Science Congress, called attention to these Blue Ridge mines as sources from which abundant supplies of copper and sulphur could be obtained, stating that England imports from Spain sulphurets of iron for sulphuric acid, with which to treat the South Carolina phosphates, and that South Carolina brings native sulphur from Sicily for the same purpose, while the mountains of the Blue Ridge contain deposits of sulphur ore as rich as those of Spain. In the Great Valley there are excellent freestones, good quality brick-clay, kaolin, and several varieties of marble. Brown hematite iron ores are found in pockets in all portions of the valley, under exists in many places. Lead and zinc have been worked for many years, and the deposits only require development to make the mining for these metals an important industry. Bituminous coal is found in the counties in the south-west where a portion of the Great Appalachian coal field of the United States crosses Virginia Territory, giving it nearly 1000 square miles of this remarkable deposit of fossil fuel. As the development of the mineral resources of a region both assist its industrial progress and are assisted by it, Virginia may well be congratulated that in this respect she enjoys an excellent position. The climate is all that can be desired, the animal and vegetable productions are ample, manufactures are opening up, and there are great facilities for extension, whilst few States are as well provided with the natural highways for coast and foreign commerce. The wide circulation of the Summary cannot fail to be highly advantageous to the State, and may be useful to capitalists in this country who are seeking a field for the application of their capital.

* Virginia: a Geographical and Political Summary, embracing a description of the State, its geology, soils, minerals, and climate; its animal and vegetable productions; manufacturing and commercial facilities; religious and educational advantages; internal improvements and form of Government. Richmond: Prepared and Published under the supervision of the Board of Immigration. London: Trubner and Co.

I. X. L.—We hear that rich ore has been struck in the lower level of this mine, and that the drift is nearly at the great ore chimney from which the rich ore was taken in the upper tunnel in the early days of this district. We look for a brilliant future for this mine. The Scandinavian road has been shovelled out up to the Exchequer Mine, and the Exchequer teams will soon be on the road hauling lumber to and from the mine. The weather has been quite warm this week, and in consequence thereof the snow is disappearing very fast. On Tuesday last we had a fall of rain, which continued during the day and into the night. The grad-

ing for the extension of the Truckee and Virginia Railroad from Carson to Genoa will commence early in the spring, and it is expected the cars will be running within the next eight months. Its completion will bring Silver Mountain within 25 miles of the terminus. We are getting quite a large Chinese population here, and the fracas that occurred among them on Thursday last may be a forerunner of more serious disturbances. The Chinese are quarrelsome and their hot blood is getting hot. If more fights occur among them, and Justice Ford is called upon to take a hand in the mess, we hope he will inflict penalties that will not only cover costs, but assist in paying the county indebtedness.—*Alpine Chronicle*, Feb. 10.

FOREIGN MINING AND METALLURGY.

There has been a brief outbreak of winter at Paris, but this circumstance has not exerted much influence upon the Parisian coal trade, which has been distinguished by the stagnation which it has so long exhibited. In the Nord and the Pas-de-Calais the situation also has not improved. The extraction has been reduced as much as possible, shorter working hours being the rule, but this has not prevented an accumulation of stocks, and sales have only been effected at heavy sacrifices. Floods have interrupted and impeded deliveries of coal by canals; but, under present circumstances, there have not been many complaints as to this, since it is not so much means of transport as order which make default. In the basin of the Loire coalowners are not much more satisfied with the state of affairs than in the Nord; the home consumption of the Loire district certainly shows rather more strength, but deliveries to more distant points leave a great deal to be desired. M. Vuillemin, engineer-in-chief of the Aniche Company, has been appointed president of the committee of colliery proprietors of the Nord and the Pas-de-Calais, in succession to M. Bigo, deceased.

The imports of pig-iron into France declined to rather an appreciable extent last year as compared with 1875. The quantity of pig made in France last year is returned at 1,395,000 tons, or 20,000 tons less than the corresponding production for 1875. The production of iron in France last year was 873,000 tons, or 31,000 tons less than in 1875. The production of rails especially fell off in France last year, having declined to 85,000 tons, as compared with 125,000 tons in 1876. The production of steel also declined to some little extent in France last year, having receded to 230,000 tons, as compared with 238,000 tons in 1875. There was, however, an augmentation of about 3000 tons in the production of steel rails last year. The consumption of steel rails in France last year is considered to have remained about stationary. As regards the current aspects of the French iron trade there is nothing interesting to report; prices remain at about the same level, and no fresh order of importance has been received. A house is being constructed at Paris, from which will be entirely of iron, with the exception of its two street fronts.

The weather has been severe in Belgium during the last few days, but notwithstanding this domestic qualities of coal do not show any advance in prices. The reason for this is probably a belief that recent severe weather must be regarded as accidental, and not likely to last. Metallurgical industry remains in the same dull, depressed condition in Belgium, and this circumstance, of course, tells adversely upon the Belgian coal trade. Floods have also impeded navigations on canals and rivers: and, upon the whole, the state of affairs is not brilliant for Belgian coalowners. Prices in the Belgian coal trade are almost what buyers choose to make them, and it is not at all difficult to conclude contracts with deliveries spread over the ensuing twelve months. Although the present severe crisis in affairs cannot last indefinitely, the fact just mentioned proves that its end is not yet immediately at hand. The Belgian sugar manufacturers are concluding contracts for the ensuing season upon advantageous terms.

The Belgian iron trade does not present any very great interest either as regards important orders or advancing prices; these latter can, of course, only be the result of a decided revival in affairs. Almost all the principal Belgian establishments have, however, employment assured to them for some months to come, and it is hoped that the spring will not fail to bring some little activity with it. Meanwhile there are great complaints as to the general condition of Belgian metallurgical industry. M. Malon is about to present to the Belgian Chamber of Deputies a proposal for an extraordinary credit of 720,000*l.* of this sum 280,000*l.* is to be applied to the construction of the additional rolling stock which is considered to be required to ensure the satisfactory working of the Belgian State Railways. It is said that the re-starting of the Central Rolling Mill at La Louviere is in contemplation; plates are the speciality of these works, and it is this circumstance which induces the management to re-start the concern, notwithstanding the want of animation which business generally exhibits. The Low Countries have decided to admit iron and other metals free of duty. A contract is about to be let at Gluckstadt for seven locomotives and tenders for the Gluckstadt and Elenshorn Railway.

ST. JOHN DEL REY MINING COMPANY.

To remove the anxiety felt for some weeks for detailed information the directors have published, entire as regards any information relating to the mine or the operations thereat, the letter received from the superintendent, on Monday, in which there is nothing to cause uneasiness regarding the mine. As to the produce and yield for the first two divisions of February (19 days) the directors have no information beyond that contained in the telegrams. The directors learn with surprise that a report is being industriously circulated by parties interested in the sale of another mining property in Minas Geraes that they (the St. John del Rey directors) have been in treaty for it. There is not the remotest foundation for such a statement; they have never even given the matter a thought, for they are quite satisfied to devote their attention to the Morro Velho Mine alone.

The advices received on Monday are da d. Morro Velho, Jan. 31, and state that the general work within the establishment, underground and at surface, has been uninterrupted during the last two weeks of January. The rainfall for the month has been 6.94 in., and for the whole month 12.43 in. On Jan. 23 the rainfall was 3.06 in., and was exceedingly trying to the w. resources, cuttings, banks, and roadways, causing in many places serious and extensive earth-slips. The water supply, however, was safely conveyed to the works without the slightest interruption, and the machinery, except when stopped for repairs, has been kept steadily and constantly at work. One of our main lines of road, that to the Taquarussu and Lages, about 45 miles in length, became stopped by earth slips and severe weather, so that conveyance of timber from that district became abrupt and complete. Labouring forces could not be obtained on the spot, and, therefore, it became necessary to form a new road, from Morro Velho, to the district, and the roadway will be open for traffic by Feb. 3. Many large logs of timber were stopped on the way that will next week resume their journey towards Morro Velho. Fortunately the more serious damage to the Mattosinhos road, 49 miles in length, occurred beyond Venda Nova. The smaller breaches were cleared by the company, and all the timber on the road this side of the former point has been brought in, giving 23 acceptable and fine logs. Repairs of the road between Venda Nova are arranged to be commenced on Feb. 5. There is reason to expect they will now receive a large quantity of log timber from each of the above, their largest

During the last fortnight of January the daily average attendance of natives in the mine department has been 174.35; daily average number of borers being 114.85; the mineral quarried and delivered on spalling-floors, 3709 wagons; this gives for each borer for the 14 days, 32.31 wagons; or at the rate of per borer per diem, 2.30 wagons—showing a satisfactory increase of native mine force, which at present is equal to immediate requirements. More than the average amount of mineral has been raised, and delivered steadily at surface without any stoppage or

The sinking for January, according to the measurements just made, amounts to vertically 5 1/2 ft. 9 in.; driving eastward in dump section extended, 7 ft. 9 in. There is no perceptible alteration in the quality or size of the lode. In the dump section it appears to be rather larger than it was at the end of December. The mine is quarried in the west station of the excavation drawn by the B kibble is as heretofore very much mix with poor killas and quartzose material, which forming not an inconspicuous proportion of the mine's brought up by that kibble, greatly tends at the present time to lessen the produce. The ore in the eastern section is clean, comparatively pure, and would give a good produce per ton if carefully treated without killas. During the present division the ore is rather less killas being reduced, the spalling floors from the mine. In the upper part of this section as yet there have not space for many borers, and the ore is tedious to bore and does not blast freely.

The pumping machinery has acted well, notwithstanding the heavy and trying rains. There have been several stoppages of the stamping mills, one rather long one of the Potosi for repairs, and the duty has been thereby lessened. They have been kept fully supplied with water, and the usual proportion of water has been mixed with killas. Auriferous and amalgamated has been in scarcely so large a proportion as during some previous fortnightly periods, the general sand passing from the mills and over the strikes being rather lighter than heretofore, and not likely to yield so much gold per cubic foot. Having an abundant supply of water, all the arrastres have been kept fully at work, and have passed a moderate proportion of the tailings sand. The two stone breakers are now capable of breaking more mineral than we can conveniently furnish them with on the general spalling floor, where they are placed. They work about 13 hours daily at present,

and crush about 200 wagons of mineral in that time. They are well driven by the small turbine erected to drive the first single machine.

small turbine erected to drive the first single line of pumps. The mine is situated during the second division of January, 13 days of the month, 3,390.9 oits., derived from 2154 tons = £215 per ton, or in English, 1543-7529 ozs. troy = 7166 oz. per ton. This is about an oitava per ton lower yield than in the previous first division, which gave 7-314 per ton. The chief difference has arisen in the general mineral, which gave 6-033 oits., independent of re-treatment produce. It now gives only 4-504 oits. There has been and still continues to be a large proportion of poor mineral quarried in the western section of the mine excavation which causes this low gold return. But it is right this mineral should be removed, cleaned down to the wall, and this is the proper time to do so. If we left this mixed mineral, and turned to quarrying the pure ore, we could very quickly increase the gold returns. The mineral nominally free from killas (there has been unfortunately much killas stamped with it) has, notwithstanding, given 7-483 oits., which is only 400 oits. per ton below its previous yield in the first division. As to the upper portion of the lode in section 218 is brought to the surface by the new shaft, and the borer, we shall have from that section increased returns of mineral and gold. A second collar is now well forward towards completion, providing space for borers and quarrying the mineral immediately below this position, and this will also aid in getting an increased supply of good ore from this eastern ground.

FOREIGN MINES

ST. JOHN DEL REY.—Telegram from Morro Velho, dated Rio de Janeiro, March 5: Produce for eleven days, second division of February, 8500 oits.—\$2937, yield, 5.1 oits. per ton. Produce small, from large temporary admixture of killas and quartz. All going on well.

RICHMOND.—Telegram from Eureka, Nevada—Hall, London: Week's run, \$42,000; week's produce of refinery, \$32,000.

R. Rickard, Feb. 10: Since my last we have resumed work in the 600 and 700 ft. drifts. The 100 is still in shale, but the nature of the shale has changed, and we are expecting to strike the lime shortly. The 600 has been drifted 23 ft. in ore, and we have turned the drift to the north-west, crossing the ore body to ascertain the width at this point; we shall at the same time prepare to sink a winze to the 700. Nothing has been done in the 800 drift since my last. No change in the S&W on contact. The main ore body is still in place and unaltered. All the workings on the west side of the hill are without change. All the furnaces are in good working order, and are smelting large quantities of ore.

in good working order, and the 1000 ft. No. 1 winze, below the 700 ft. main drift, has been extended 30 ft.; it has now entered ore, which is, as far as seen, of low grade. No. 2 winze, in bottom of same level, is about the same as last reported. The 700 ft. drift is still in shale; not much work has been done in this level since last report. The 500 ft. level is being worked by the 1000 ft. No. 1 winze, and the 400 ft. are commencing with No. 2 stope. The 400 is opening out very well; we cannot tell the extent of the ore in this level, not having crossed it; it appears to be extending to the east. The stopes in all parts of the mine are looking about the same. The workings are being extended to the west, and the 300 ft. level. All the ore has been in full blast all the week, and are still in good order.

SANTA BARBARA (Gold).—March 8: Mr. Hilcke (Pari, Jan. 26) reports that the operation, both in and out of the mine, had been carried on with regularity during the past fortnight, the aspect of the lode being very much the same as when last advised. Nothing of consequence had occurred to call for special remark. The rains, although not so heavy as during December, were as continuous, and the roads were consequently in a very bad condition.

The roads were consequently in a very bad condition. The storm, which commenced on Jan. 28 continued until Jan. 31, and gave us a full supply of water for three days only, which we utilised by starting up the Red-Dog claim, and run just three days, when the water again gave out, and we were obliged to again stop washing in this claim; yet, at the same time, the water from the Red-Dog claim, which was running down the same with a view of blasting the bank on the south side of the shaft, and believing it to be perfectly secure we exploded the blast of 60 kegs of powder on the 5th instant, but found upon examination that the rock on either side of the cut upon which the timbering was laid had crushed down, bringing up the shaft, and cutting the shaft in two, so that the shaft was now separated into the shafted

native but to run a slit through the blasted ground to connect with the shaft, about as it is quite difficult to do. The dust will be finished after which we shall again resume washing. We are fortunate enough to have the water supply, which I must say does not look at all favourable at this time, for it is regular summer weather, and looks no more like rain than in mid-summer. The blast exploded in Neece and west on Jan. 28 was one of the very best I have ever had in this claim, it being so closely cemented that powder will not pulverise the whole mass in any event, whether we use a large amount of powder or an average charge; this one appears to have done everything we could expect. We are steadily washing in this claim, and have been since Jan. 21, and have picked up quite a full amount of gold. We are getting a little better towards the last of this month. The water in this claim is washing partially employed, the surplus water above Neece and West head; this claim is opening much better than I anticipated; we have a splendid pressure, and as yet have not done any bank blasting, and I am in hopes to be able to pipe the majority of the ground, in which case it will lessen the running expense very materially. We find that our shaft was raised on the west side of the channel, and that the rock is pitching towards the east rim, but think it cannot go much deeper as the deep channel only appears to be about 200 or 225 ft. in width at this particular point, and appears to be the end of the channel. The ground is much higher than the level that the strata we are at present washing is not rich, but have full confidence that we shall yet strike a good mine in this set of claims, which is quite extensive, and will afford steady washing many years to come.

extensive, and wintered successfully many years to come. BLUE TURTLES were not abundant, but we washed up both claims this year. But much of our water supply we had to buy from the South Yuba Canal Company, owing to a break in the ditch a little below Alpha-road. The ground through which the ditch was constructed slid off bodily for about 50 ft. in length. We were fortunate in not having much water in the ditch at that time, and to discover the ground giving way before the stream came on, or the damage would have been much greater. The ditch is well secured now, and the break flumed over. The water reached the Tent to-day. We encountered much difficulty in many places along the ditch in bringing the water through, the snow having frozen hard in the ditch, all of which we had to break and float out through the waste gates as we advanced with the water, making our progress both slow and tedious. Had we reservoir storage of our own at the head, or could buy water to run through the ditch, we could have done more, much of the trouble would have been avoided. The ice did not melt, and would interrupt the water but very little in the running stream in the ditch. We shall do our utmost to try and keep the ditch clear the balance of the season. Both claims look favourable if we can have a fully supply of water to work with.

ARGENTINE.—Capt. Coward, Jan. 20: Improvement in the 44 South Pique, No. 4. For the first time, past the 44 south has shown symptoms of improvement, and the 44 south lode opened up into pyrites; the end is wide, or only 3½ feet in breadth, apparently of good quality as the rich pyrites in the course of the lode, and in the bottom. There has not been time to make an assay, but in my next I will give you the results. The lode in underlie continues without change—a good lode. The masonry at Pique will be completed by the middle part of next week, and masons will commence cutting quoins for Oxlant's caliche.

mine foreman's report for last week. I claim, Feb. 12: Received herewith the mine foreman's report for last week. I do not see that I have anything to add to it as to the state of the mine. I am in hopes to get the Exchequer hoister to the works in eight days more, when I shall recommence sinking.—Feb. 10: The north drift is now in a distance of 463 ft. from the cross-cut on the 200 ft. level, and is making the usual good progress. The drift was interrupted by a strong flow of water from the 14 ft. driven this week, and said drift is now 14 ft. from the full width of the drift now at the face, and making in the hanging wall which prevents me giving the correct width of the ledge at present. Every indication possible of finding a good body of ore is not far ahead. The uprise started from the 200 ft. level to connect the O. K. shaft is now up 103 ft., 11 ft. driven this week; the drift is now 11 ft. from the full width of the ledge at the face. The drift is hanging wall not yet respected, but when the proper time comes there may be some good ore found. Everything in and about the mine is running

and working well.—H.N. RYAN, Foreman.

—Lewis Chalmers, Feb. 16, 1906.—To-morrow I am as likely as not to run into a body of ore into the 200 as will pay all your outlay. All the indications are that way: lode widening, veins improving, and water increasing. My plans are not altered, and they are as you know—1. To run to the ore body in the 200.—2. To sink to the 400.—3. To take out ore where I can find it. Running to the ore body in the 200 necessitated raising to the O.K. for ventilation.—4. I will try and let my ore hauling.—5. I must build a boarding house at the mine. The men complain bitterly of trucking up to the Escheguer boarding house at night in the deep snow. I ran the Buckeye adit because I was getting good ore in it, and I did some work in the lower tunnel for the same reason. Mr. Arnot completed his I.X.L. mill contract with the exception of the mason work of the retorts and dry kiln chimneys, which if done in frost would not stand; he is to do this when he returns in spring to make the experimental run. He preferred doing this to starting the mill in frosty weather, running the risk of bursting pipes, &c., by a sudden stoppage, and I agreed with him. He has given you a first-class mill, *apropos* of which I send you a letter I had from his last mail. He is wrong in saying that I suggested that the agitators should have iron sides. He suggested, or rather said, he had

given them the ironides I approved.

Extract from the letter from N. D. Arnot, of the Vulcan Ironworks, San Francisco, to Mr. Lewis Chalmers, dated Feb. 10:- "I think you will have no sort of hesitancy in informing your directors that the I.X.I. mill just finished by me is the finest, best equipped mill in the State of California and Nevada, and the most complete and modern of its kind more than that of the letter of the contract required. At the time of entering into the contract I had no idea, and I suppose you had not, that the whole excavating would have to be done in solid rock, which has entailed a fearful expense, as you well know. Though the dry kiln is outlined on the plan of the mill building I supposed, until suggested differently by you, that the building of it would properly be part of the furnace, and would not be required of me. You well remember that our first understanding, and until after the contract was entered into, was that we were to have wooden sides for the agitators, but that at your suggestion iron ones were furnished. There are a great many additional alterations that I could name which entailed on me additional expense, which your company has had the benefit of, which could not have been entered into had I not entered into the contract with the work of the erection of putting up such a mill as would be more than satisfactory to yourself and company, and which should be second to none on the Pacific Coast or elsewhere, but my pride was in the work, and with it took the money."

EXCHEQUER (Gold and Silver).—Lewis Chalmers, Feb. 12: You will be glad to hear that I succeeded in getting up the long (35 ft.) braces for the new gallews for me, and hope to have them up this week. The engine running. I have sold the engine for \$1000, for \$600, to the I.X.L. Company. The weather looks so settled that I have to-day sent down for one of my horse teams to haul ore from the mine. Mr. O'Harra should have been here on Saturday, but is detained in Reno till to-day. When he is ready I am ready. I think that it will take him ten days to get his machinery in running order. My millwrights are now at work on the cage which raises the roasted pulp to the pan floors.

—Feb. 15: Mr. O'Harra and his partner are busy getting their machinery attached to the furnace, and I hope to be ready as soon as they are through. My team is stuck fast in the snow at I.X.L. yesterday, but will make the trip for ore to-day.

PESTARENA UNITED (Gold).—The following are the returns for February:—From Val Toppa district, 214 ozs. 11 cwt. 5 grs. of gold, obtained from 432 metric tons of ore; yield per ton, 9 dwts. 23 grs. From Pestarena district, 11 ozs. 0 dwts. 12 grs., obtained from 15 metric tons; yield per ton, 14 dwts. 17½ grs. Total

from the two districts, 225 ozs. 11 dwts. 17 grs. of gold, from 447 metric tons
ore amalgamated.

[illegible]

NEW ZEALAND KAPANGA.—J. Thomas, Jan. 13: Since my last advice I am pleased to inform you the new water-wheel has been taken to pumps, and fixed underground at the No. 5 or 50 ft. level, for the purpose of pumping, and winding, to sink the winze on the course of the lode under that level on the N. side of the mandel slate of gold ground. The water-wheel is driven solely by the drainage water of all the mine, which is taken up and concentrated to one point, and is thus utilised before it runs to the engine. I consider that wheel will pump 250 ft. wind, and prove the mine 25 or 30 fms. under the level, causing no expense, and is a direct saving of some thousands of pound. The wheel commenced to pump the water from the winze on the 6th inst., and had the water in the fork of the 8th. Previous to sinking I had and am now laying down rails on the face of the run of the winze for the wheel to pull the stuff, also the winding gear. The road will be finished in four or five days, when I will put a full pair of new horses to sink immediately. I am highly gratified to say our subterranean water-wheel balance both, and connections are performing their work beautifully, and are now producing a fine result, and saving largely of expense. I must not omit also to tell you that we have made and constructed everything in connection with this work on the mine, with the exception of the 4-in. lift of pump. On the 1st inst. I commenced to drive the north end of No. 5 level on the course of the lode, and have driven 8 ft.; the lode is 2 ft. wide, composed of, soft quartz, much intermixed with clay, and no visible gold is yet seen, but the flooken, which is 5 to 6 in. wide, and attached to the hard regular hanging wall contains loose gold, which I have detected by washing, an am saving it carefully for stamps. The lode stuff from the winze is also good crushing stuff, which will be increasing in quantity as the ground is opened. I will put a pair of men to drive the south end of the No. 5 level about the same time, and will be saving some returns. Very little work can be done in opening new ground this month, being so engaged getting the wheel and pumps to work.

For remainder of Foreign Mines, see to day's Journal.]

THE WILD DUCK, OR SPORTSMAN'S ARMS.

"Well, men," says Jan Temby, "I've ben to St. Ives since our lammitten, and had a long disceose with some old miners about the run of the lodes of St. Ives district going east, for, as Tom Penhale said, we may be sure they do not stop in St. Ives bay. Now, looking east from the high ground between St. Ives and Lelant we see opposite Godrevy, Gwithian, Phillack Towns, &c. All the lodes of St. Ives and Lelant must run through this district, and we know less about them than the lodes of California and other places ten thousand miles away. Is there any reason why the lodes should not be so good east of the bay as to the west of it? From Godrevy and Phillack Towns to Portreath is a good stretch of untried mineral ground, and from Portreath to South Towan Mine is another long stretch of mineral ground untried. East of this point we come to St. Agnes and I suppose no man will say but hundreds of lodes are in St. Agnes parish untried. Suppose we take the district from Phillack to Godrevy east to South Towan, and from the north cliffs three miles south; this piece of ground would take in miles of untried lodes." "Iss," says Jemmy Dowa, "and some of the finest lodes in the county, for I can mind very well when tens of thousands of tons of mundie wor rose in Wheal St. Andrew in Gwithian parish, and there is any truth in the old saying that 'mundie ride a good horse there must be a good one there, but the ground Jan Temby we over is full of minerals, and nobody don't know nor don't care a bit about it, and the people going about like a passle of fool, throwen away their money in furrin parts; another lot is groaning and crying out the price of tin will seat-up everyone of our lads. Why, the best thing them wise men can do is to rise as little tin as possible till there is a better price, and rise copper, jack, and other minerals in the ground we have been telling about." "Now that what I call good advice," says Jan Jewill, "and if some of our learned men of the Camborne Institution—I believe is the name ob'd—would tell we poor ignorant creatures where to find new lodes of good ones, and point out the ground where wor a good lode, and where wor a bad one, it would do a mighty lot more good than telling about tonite and other explosives, for if the great men can tell for certain when looking upon the back of a new lode whether it would be good or bad, the don't know more than we; we can say we don't know, and the can't say for certain, so it is six of one and half-a-dozen of the other." "But remember, Jemmy," says Uncle Henry Treylon, "what would become of mining but for men of learning and science." "Well, I don't know, I'm sure," says Jemmy, "but I think tes something like this here. I once knowed a old gentleman, and 'twas said at one time he tried all rogneries in his business, but a didn't answer; then a tried all honesty, and that didn't answer; and then a tried part roguery and part honesty, and made a fortin. So part practice and part science may do very well when mixt, still I say, Uncle Henry, if all the members of the Institution—chairman and all—wor rolled up into one big member and all their science crammed into that big member's head, and I couldn't say for certain that a new lode would be a valuable one, then I say I know as much as he, or all of them put together. I mean on that there subject, and I don't know a greater one than mining." "I have been listnering with a good deal of attention to your remarks," says Cousin Will, "and I must say he must be a clever man indeed who could positively say from the appearance of the back of a lode that it would be a valuable one." "In this case," says Jan, "if a couldn't, a working miner's opinion is as good as the opinion of the most learned man living, but I see Old To coming. Why Tom, old boy, thee'st late. How's the new dressing machine getting on?" "Stop a bit, will ee," says Tom, "I've been that a man can't fight or pray well upon a empty stomach, and I'm sure he's in poor tune for taalken." "To be sure," says Jan Temby, "eat away, Tom, and here's a dram for thee, old boy, and after that thee's do I reckon." "I'm right as a line now," says Tom, "and that discovered eating and drinking was a great man, but let vee tell ee, souse, that my dry dressing machine is a great discovery to me, and so you'll find after a bit, for all dressers do, or ought to, know that you can't put ore to watter without losing the cream ob it, and every time you turn or move it in the watter you lose ore, and I'm quite sure if all ore was dressed dry there would be millions of year saved, and in some kinds of ore the more you dress the more you lose. I tell ee, men, there is too much dressing, for what we do for the one ore will not do for the other, even by watter, but when all is done the same way I only wonder a good deal more work doesn't wash away down the rivers. I see'd the manager ob a bal some time ago introduce a new plan for cleaning hutch-work. The wase, a said, was a lot heavier than the ore. Well, he had long a sreake with a stomps stream of watter. I ax'd him what was doing, and a said his plan was to wash back the ore clean, and let the heavy waste stand in the bend of the sreake. I said, 'I see think the light ore will wash away?'" "Do ee see the big catch-pit?" say he. "Iss," says I, "but I don't think you'll find much there as I mit a good deal coming down the road shining like goold as wor coming up to bal." "You don't know nothing about it," say he. "Now, men, if that ore were dressed dry the adventurers would make money, but the managers plan washed away the ore and the money, and it wor never found again in the big catch-pit. I tell men, you will say my plan of dry dressing is the right thing."

Cousin Jack's Unpublished MSS.

As an improvement, HERBARD, of Chicago, has a compound flux of a greyish-black color, containing silica, and in addition generally used by preference in small quantities known as hematite. A very proportion of the description of the flux should the ores be selected which attracts the hearth. It can be conveyed in a calcination, or if the ores at the furnace purposes he line of alumina and lime. A necessary quantity of the quantity of carbon is the state of iron.

To produce a surface as at present. The absorption for lining the furnace, the amount used in the use of alumina and lime, a quantity of lime, the state of iron. The quantity of furnace, in a similar manner, now employed. From hematites, the description of a mixture mixed with the regions to cause a reaction of carbon, pitch or tar, to be any convenient entirely on the part contain 60 per cent. 60 per cent. of iron, ores 13 to 16 of the termed tap and preference calcination, steam mixed with the same way as from cast-iron steel he selects with the requirement is sufficient, and the proportion of small scale; if the description of the puddling furnace

The Red Mol developing a m so far as to g highly satisfi short account the inventor of ments of what the steel they a were directed their operation commercial re bella, on the ore are to be closely together, rial is sifted a a disintegrator cheaply and re described. But with the ore i all such extra oxide of iron. magnetic separ capable of deal the particles of into their proper thus got as pure operation is to taceous matter to the carbonaceous or other suitable in excess of the bonaceous powd brick press, and consists of a seri retorts are heat producer, and at the carriage of hot air into the pletely envelope still further del charged. Air h bation of the g heat where it i fuel used. The importance in co ideas of the m one of these re The door being bricks, consisti the retort, is cl end by means o stacks of brick filling the retor full red heat fo carbonaceous m will have becom convey this red air, and to keep Ordinary coal g into the inside ward pressure d inside of a m of the m is moved, and a t put in its place tools, by which placed at the d is turned off, a kept carefully c scientific cooli of the receiver, chine for a fin mixing, the st percentage of f in the form of power into so compressed a n ready to be u an ore or any

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MANUFACTURE OF IRON AND STEEL.

As an improvement in the manufacture of cast-iron Mr. F. W. GERHARD, of Cosely, Stafford, proposes to employ what he terms a compound flux, named by mineralogists and others as basalt (of a greyish-black colour), green rock, diorite, igneous rock, and trap, all containing silica, alumina, and lime in varying proportions, and in addition generally manganese, soda, potash, and iron. This is to be used by preference in a blast-furnace with, if requisite, an additional quantity of carbonate of lime or oxide of calcium with ores known as hematites or magnetites (oxides of iron) with the necessary proportion of carbon, but he does not exclude the use of any description of iron ores or silicates of iron with the above flux. He should the ores or silicates of iron contain phosphoric acid. He calcines them in heaps, mounds, or appropriate furnaces, and concentrates the heaps, mounds, or furnaces so that high-pressure steam can be conveyed occasionally into the mounds or furnaces during its calcination, or if more convenient into the blast-furnace when smelting the ores at intervals. To melt cast-iron for foundry or other purposes he lines a cupola furnace with a mixture of silicate of alumina and lime. Or he adds to the cast-iron to be re-melted the necessary quantity of basalt flux with, if required, an additional quantity of carbonate of lime, which prevents the formation of silicate of iron.

To produce wrought-iron from cast-iron he employs the puddling furnace as at present constructed, or any other form more convenient. The above-mentioned compound flux or basalt as a protection for lining the bottom and sides of the puddling furnace prepared in the usual way, with or without an addition of silicate of alumina and lime (the fusibility of the slag can be regulated by the quantity of lime employed), which prevents the production of silicate of iron. The mill or re-heating furnace, or any other description of furnace, employed in the manufacture of iron to be prepared in a similar manner instead of sand or other materials which are now employed. For the direct mode of producing wrought-iron from hematites, magnetites, iron scale, silicates of iron, or any other description of ores. The ores to be finely ground (when required), and mixed with silicate of alumina and lime in sufficient proportion to cause it to adhere, to which is added the requisite proportion of carbon, either ground coke, coal dust, anthracite, steam coal, pitch or tar, to be well mixed with water dried or compressed in any convenient way. The proportion of carbon must depend entirely on the percentage of iron combined in the ores. If the ores contain 60 per cent. of iron 19 to 25 parts carbon are required, if 50 per cent. of iron 16 to 20 of carbon, and if 40 per cent. of iron in the ores 13 to 16 of carbon or thereabouts. The silicates of iron (locally termed tap and blue cinder), which he terms waste, are to be by preference calcined as above with the addition of high-pressure steam mixed with silicate of alumina and lime, and treated in the same way as the ores above mentioned to produce wrought-iron from cast-iron in a lined puddling furnace. To produce puddled steel he selects by preference clean iron scale, to be mixed as above with the requisite proportion of carbon, 21 to 22 per cent. of carbon is sufficient, and oxide of manganese or ground manganiferous ores. The proportion of manganese to be ascertained by experiment on a small scale; if scale cannot be procured hematite or any other description of ore to be treated in a similar way to the scale in a lined puddling furnace.

NEW PROCESS FOR MAKING STEEL.

The Red Moss Metal Company, Warrington, have been some years developing a method of making steel direct; and having succeeded so far as to get the new steel in considerable quantities, and with highly satisfactory results, into the market, we propose to give a short account of the process, principally in the words of Mr. Larkin, the inventor of the process, and to add a few supplementary statements of what we ourselves have seen of the company's works, and the steel they are daily producing. The initial efforts of the company were directed to the magnetic iron-sands as the most convenient for their operations. These, however, have been for some time, and for commercial reasons chiefly, abandoned in favour of ore from Maraballa, on the south coast of Spain. The large and small lumps of this ore are first passed through the jaws of a Blake's crusher, set as closely together at the bottom as practicable, and the crushed material is sifted as it falls. The coarser portion is then passed through a disintegrator. In this way the whole bulk of the ore is very cheaply and readily reduced to the condition of the iron-sand already described. But of course the gangue of the ore is crushed equally with the ore itself; and the next step is to separate the actual ore from all such extraneous matter, and get as nearly as possible the pure oxide of iron. This is very effectually done by means of a self-acting magnetic separating machine, specially devised for the purpose, and capable of dealing with large quantities of material. In this machine the particles of magnetic oxide are picked up by magnetic attraction, and carried into their proper receptacle, while the refuse is safely deposited in another. Having thus got as pure and rich a material as possible in a powdered condition, the next operation is to thoroughly mix with it a sufficient quantity of powdered carbonaceous matter to combine with the oxygen of the ore, and thus effect its reduction. The carbonaceous matter used consists of powdered charcoal and powdered resin, or other suitable bituminous substance, the two being reckoned together somewhat in excess of the oxygen to be removed. This mixture of powdered ore and carbonaceous powders is slightly warmed, and compressed into bricks in an ordinary brick press, and will then be ready for the reducing furnace. The reducing furnace consists of a series of D-shaped gas retorts, with doors to open at each end. These retorts are heated by a fire acting somewhat upon the principle of a Siemens' gas producer, and are thoroughly supported throughout their entire length by an intricate arrangement of brickwork, which also serves to prevent a too ready escape of hot air into the flue. The burning gases from the fire are also made to completely envelope the retorts by being carried over and under in a zigzag way, thus still further delaying their passage, and arresting the heat with which they are charged. Air holes are opened at regular intervals in order to complete the combustion of the gases as they circulate around the retorts, thus securing the greatest heat where it is actually wanted, and also securing complete combustion of the fuel used. The consumption of the smoke is perfect. There are other points of importance in connection with the furnace, but as they would not help to a clear idea of the method as a whole they may be omitted. Let the reader now imagine one of these retorts at an average working heat empty, and ready to be charged. The door being removed from the feeding end of the retort, a small stack of pressed bricks, consisting of ore and carbonaceous matter, and of bulk to fill the section of the retort, is closely packed on a rectangular iron plate and pushed into the further end by means of an iron rod. The plate is then withdrawn, leaving the small stacks of bricks securely placed. A second and third feed immediately follow, filling the retort, which is at once closed. After having been exposed to a pretty full red heat for nearly twenty-four hours, gas will have ceased to be given out, the carbonaceous matter will have become practically consumed, and the oxide of iron will have become converted into red-hot iron powder. The next problem is how to convey this red-hot powder from the retort without exposure to the atmosphere, and to keep it so till it is cold. A charge is now supposed ready for removal. Ordinary coal gas is first, by means of pipes provided for the purpose, turned on into the inside of the discharging end of the retort, in order to produce a full outward pressure of gas while the discharging door is removed, the door being at the underside of a projecting end-piece of the retort. The door being thus removed, an iron receiver is brought up closely under the projecting end-piece, and securely supported there. By a similar arrangement of pipes gas is now let also into the inside of the feeding end of the retort, when the door of that end is quickly removed, and a temporary door with a wide slot half-way down the middle of it is put in its place. The slot is for the introduction and working of the discharging tools, by which the red-hot powder is quickly pushed forward into the receiver placed at the discharging end. As soon as the retort is empty the gas at both ends is turned off, and the iron receiver containing the metallic powder is removed and kept carefully closed until its contents are cool. When the metallic powder is sufficiently cooled down, and no injury can arise from its exposure, it is turned out of the receiver, and again passed through the disintegrator and the magnetic machine for a final purification. Thus by a few simple and almost self-acting operations, requiring little more than faithful attention and accuracy in weighing and mixing, the steel-maker is able to produce pure metallic powder. For the production of tool-steel the operator mixes with the metallic powder (besides some small percentage of flux) whatever additional amount of carbon may be needed, chiefly in the form of resin. This resin easily makes it possible to compress the finished powder into solid cakes, in the same way as the bricks of ore and charcoal were compressed in the first instance. The cakes of finished material are then stacked up, ready to be melted in crucibles in the usual way, with the addition of manganese or any other alloy that may be found advantageous.—*Warrington Guardian*.

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STOURBRIDGE FIRE BRICKS AND CLAY.

A NEW STEAM CAR.—A new steam car has just been constructed
by Mr. Robertson, of Glasgow, and several trials have been made
with it with very satisfactory results. This car differs in many re-
spects from its numerous rivals, and possesses several merits which
will doubtless be appreciated by tramway companies. It is com-
plete in itself—having no engine in front, emits no smoke, and can
be stopped almost instantaneously. None of the machinery is visi-
ble, being all placed underneath. The boiler is neatly boxed off,
and by a clever arrangement the smoke is all consumed. The
motion is exceedingly smooth.



PARIS INTERNATIONAL EXHIBITION, 1867.



VIENNA INTERNATIONAL EXHIBITION, 1873.



LONDON INTERNATIONAL EXHIBITION, 1874.



CORNWALL POLYTECHNIC SOCIETY, 1867 and 1873.

TANGYE BROTHERS AND HOLMAN,

10, LAURENCE POUNTNEY LANE, LONDON, E.C.,

AND BIRMINGHAM, (TANGYE BROTHERS), CORNWALL WORKS, SOHO.

The "SPECIAL" DIRECT-ACTING STEAM PUMP, WITH Holman's Patent Self-acting Exhaust Steam Condensers.

UPWARDS OF 12,000 "SPECIAL" STEAM PUMPS ARE IN USE.

After eight years of successful application for all purposes to which steam-driven pumps can be applied, THE "SPECIAL" STEAM PUMP STILL MAINTAINS THE FIRST POSITION IN THE MARKET, notwithstanding that it alone—of all direct-acting pumps—has been subjected to the great variety of severe tests that must be encountered in such a period of time. Some valuable improvements have been suggested in the course of a long experience, and their adoption has rendered the apparatus at once the simplest and most certain in action. There is absolutely no extraneous gear, and the steam cylinder is no longer than the pump. The valves are of easy access, and are suited for pumping fluids and semi-fluids of almost any consistency.

Holman's Condenser

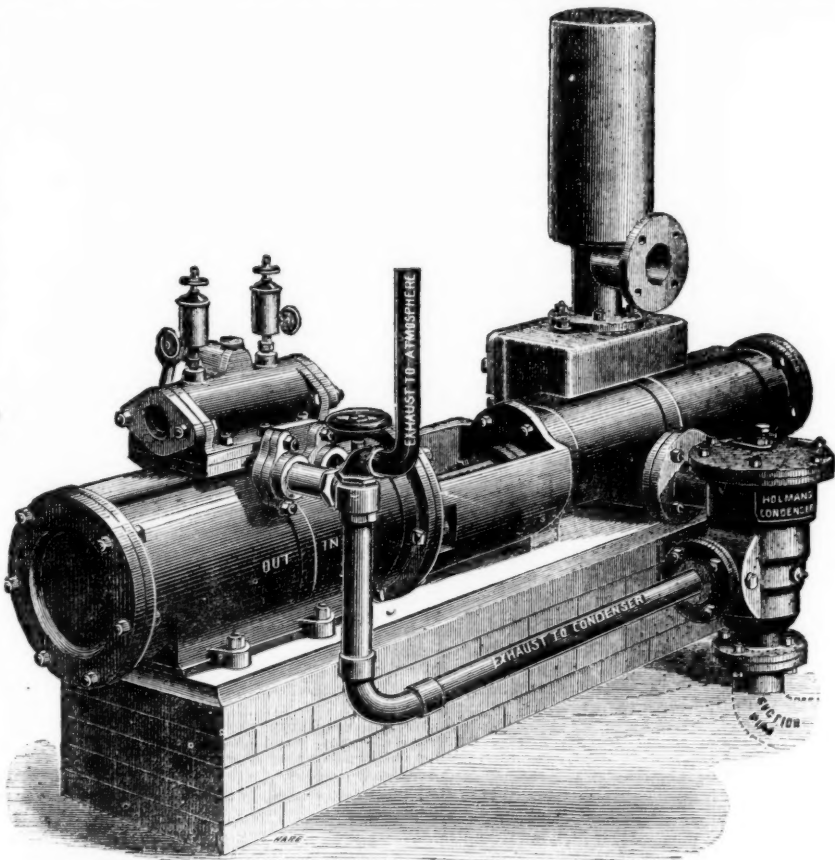
Turns waste steam into
GREAT POWER.

SAVES HALF ITS COST IN PIPES AND CONNECTIONS.

PREVENTS ALL ESCAPE OF STEAM IN MINES OR ELSEWHERE.

REQUIRES NO EXTRA SPACE.

SAVES TWENTY TO FIFTY PER CENT.
OF FUEL.



WILLIAM ELLIOT, Esq., of the Weardale Iron and Coal Company, writes under date Sept. 17th, 1875, as follows:—"We have now THIRTY-FIVE of your SPECIAL STEAM PUMPS in operation at the various collieries under my charge—some of them employed pumping water out of our pits to the depth of 50 fms.—others employed in the pits, and a good many feeding Boilers. I have no hesitation in saying that we have found them the Cheapest and Best Pumps of the kind we have tried. I can with confidence recommend them to intending purchasers."

Messrs. BURT, BOULTON, and HAYWOOD, Chemical Manufacturers, of London, have FORTY of the "SPECIAL" STEAM PUMPS in use at their works.

HOLMAN'S CONDENSERS

Are made to suit any size and kind of Steam Pump. They form a part of the suction pipe of the Pump, and while they effectually condense the exhaust steam they produce an average vacuum of 10 lbs. per square inch on the steam piston, increasing the duty of the Engine, and effecting a saving in fuel of from 20 to 30 per cent.

In Mining operations these Condensers will be of great value.

All Boiler Feeders are recommended to be fitted with these Condensers, as not only is the exhaust steam utilised in heating the feed water, but is returned with it into the boiler.

GREAT REDUCTION IN PRICES.

The following sizes are suitable for low and medium lifts:—

Diameter of Steam Cylinder ...In.	3	4	4	4	5	5	5	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10			
Diameter of Water Cylinder ...In.	1½	2	3	4	3	4	5	3	4	5	6	3	4	5	6	7	4	5	6	7	8	5	6	7	8	9	5	6			
Length of StrokeIn.	9	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	18	12	12	12	18	24	12	12			
Gallons per hour	680	815	1830	3250	1830	3250	5070	1830	3250	5070	7330	1830	3250	5070	7330	9750	3250	5070	7330	9750	13,000	5070	7330	9750	13,000	16,500	5070	7330			
Price of Special Pump ...£	16	18	20	25	22	10	27	10	32	10	25	30	35	40	30	35	40	45	50	40	45	50	55	65	50	55	60	70	85	55	60
Extra, if fitted with Holman's Condenser and Blow-through Valve	£7	£7	£9	£11	£8	10	£11	10s	£12	10s	£9	£12	£15	£15	£10	£13	£15	£16	£22	£13	£16	£16	£22	£22	£16	£16	£23	£24	£35	£17	£17

CONTINUED.

Diameter of Steam Cylinder..In.	10	10	10	10	12	12	12	12	12	12	14	14	14	14	14	14	16	16	16	16	16	18	18	18	18	18	18	18
Diameter of Water Cylinder..In.	7	8	9	10	6	7	8	9	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12	14	10	12	14
Length of Stroke ..In.	12	18	24	24	18	18	18	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Gallons per hour	9750	13,000	16,519	20,000	7330	9750	13,000	16,519	20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000	20,000	30,000	40,000
Price of Special Pump..£	65	75	90	100	75	80	85	110	120	140	110	120	130	140	160	180	140	150	160	180	200	180	190	210	230	210	230	230
Extra, if fitted with Holman's Condenser and Blow-through Valve	£23	£24	£35	£35	£20	£27	£27	£38	£38	£50	£28	£28	£40	£40	£55	£55	£28	£40	£40	£55	£55	£45	£45	£51	£60	£51	£60	£60

Intending purchasers of Steam Pumps would do well to observe the great length of stroke, short steam cylinder, and short piston of the "Special" Steam Pump, as compared with the short stroke, long steam cylinder, and long piston of the Pumps of other makers, as the efficiency and durability of the machine, and the space occupied by same, greatly depend upon this. The advantage of long strokes will be obvious when purchasers are reminded that each act of suction and delivery valves of a "Special" Steam Pump with 24 in. stroke, running at 120 ft. per minute, would open and close only 30 times per minute, as against 120 times per minute in a Pump with only 6 in. stroke performing same duty.

The "Special" Steam Pump can be worked by Compressed Air as well as by Steam.

HUNDREDS of these PUMPS are USED for HIGH LIFTS IN MINES, for which purpose they are made with 21, 24, 26, 28, 30, and 32-inch Steam Cylinders, and 36 48 and 72-inch Strokes.

The following Testimonial gives one Example of the Power Gained by the action of Holman's Patent Condensers:—

NORLEY COLLIERY, WIGAN.

Messrs. TANGYE BROTHERS AND HOLMAN.

GENTLEMEN,—I have great pleasure in recording my entire satisfaction with the working of the Holman's Patent Steam Pump Condenser which you have supplied to us. The complete condensation of the steam is, apart from its value in the strict economical sense, a most valuable feature in the drainage of underground work-

ings. The perfect manner in which this important result is accomplished by your Condenser is extremely creditable to you, and merits the thanks and commendation of the Mining Engineer. When we start the "Special" Steam Pump the Condenser commences working automatically, and maintains a constant vacuum of 10½ lbs. per square inch, even when we run the Pump upwards of 80 strokes (166 feet) per minute. It may perhaps be interesting to you to know that when we were running the Pump at 84 strokes (168 feet) per minute, the steam gauge

indicating a steam pressure of 36 lbs. per square inch, 80 yards from the Pump, and the Condenser vacuum gauge on the exhaust pipe indicating a steady vacuum of 21½ inches, I turned the exhaust steam from the Condenser into the atmosphere, when the speed at once fell to 44 strokes per minute. The working economy thus shown is really so great that the cost of the Condenser must be saved in a very short time. (Signed) J. THOMPSON.

NORTH OF ENGLAND HOUSE ...

SOUTH WALES HOUSE... ..

TANGYE BROTHERS AND RAKE, ST. NICHOLAS BUILDINGS, NEWCASTLE-ON-TYNE.

TANGYE BROTHERS AND STEEL, Tradeagar Place, NEWPORT, Mon.; and Oxford Buildings, SWANSEA.

BLAKE'S PATENT STEAM PUMP.

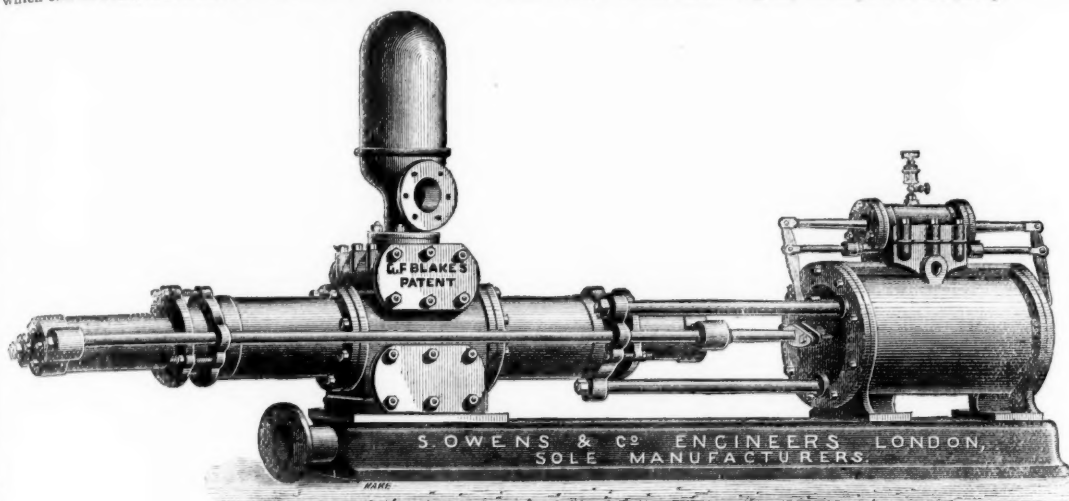
MORE THAN 10,000 IN USE.

SOLE MAKERS FOR GREAT BRITAIN.

S. OWENS & CO.,

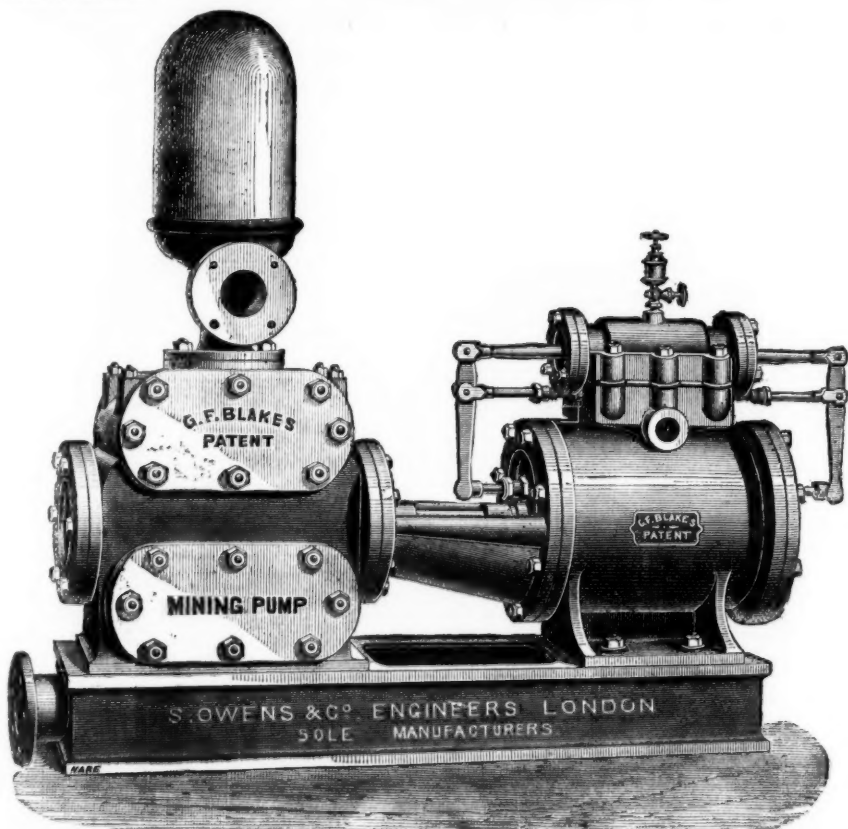
Hydraulic and General Engineers, Whitefriars-street, London;
And at 195, Buchanan-street, Glasgow (W. HUME, AGENT).

These PUMPS from their SIMPLICITY, RELIABILITY, DURABILITY, and ECONOMY are SPECIALLY SUITED FOR MINING PURPOSES, where large quantities of water require to be raised from great or medium depths with CERTAINTY. They are double-action in their construction, throwing a constant stream of water, can be made of any stroke to suit the space in which they have to work, can be arranged with any combination of steam and water cylinders to suit the pressure and lift against which it is desired to work them, are made of the very best materials and highest class of workmanship, and all working parts can be readily got at by any ordinary workman, and replaced if necessary by a duplicate part (all such being interchangeable) in the shortest possible time. For situations where gritty and sandy water has to be pumped the DOUBLE-PLUNGER PATTERN is recommended. Where space is limited the PISTON PUMP is better suited, a novel feature of which is the PATENT REMOVEABLE LINING, which can be removed in a few minutes and substituted with a new one, without disturbing any other part of the pump.



Blake's Improved Double-plunger Steam Pump.
S. OWENS AND CO.,

In placing the BLAKE STEAM PUMP before the mining world, believe they are offering the BEST, MOST RELIABLE, and ECONOMICAL PUMP that has yet been made, and solicit an inspection of various sizes in operation at their works, Whitefriars-street, Fleet-street, London.



Blake's Improved Mining Pump, with Patent Removeable Lining to Pump Cylinder,

Any combination of these Pumps may be had to suit circumstances. The following are some of the sizes SUITABLE FOR MINING PURPOSES:-

Dia. of steam cylinders..In.	12	12	12	12	14	14	14	16	16	16	16	18	18	18	18	20	20	20	20	24	24
Dia. of water cylinders..In.	3	4	5	6	4	5	6	4	5	6	8	4	5	6	8	5	7	8	9	6	8
Length of stroke... ..In.	18	18	18	24	24	24	24	24	24	24	24	30	30	30	30	30	36	36	36	42	42
No. of strokes per minute..	30	30	30	30	25	25	25	22	22	22	22	22	22	22	22	20	20	17	17	17	15
Quantity in gallons per hour, approximately ...	1440	2610	4200	5940	2940	4620	6600	2646	4158	5940	10620	2646	5160	7500	13260	4586	9000	12360	15660	6720	12000

PRICES FOR THE ABOVE, OR ANY SPECIAL SIZE, AND ILLUSTRATED CATALOGUES FURNISHED ON APPLICATION

PATENT CONDENSERS

Can be supplied for any size pump to effect a saving of fully 30 per cent. in the consumption of fuel, greatly increasing their efficiency

The Blake Pump will work under water, and as efficiently with compressed air as with steam.

BLAKE'S DONKEY PUMPS FOR FEEDING BOILERS KEPT IN STOCK.

PATENT

"INGERSOLL ROCK DRILL,"

LE GROS AND CO.

60, Queen Victoria Street, London, E.C.

5, PARK PLACE, NEW YORK, U.S.A.



We claim 40 per cent. greater effective drilling power, and offer to compete with any machine of its class.

See following extracts from the reports of Judges in awarding Medals:-

"2. Its simple construction ensures durability, &c.

"4.—The steam or air cushions at each end of cylinder effectually protect from injury.

"5. Its having an automatic feed, giving it a steady motion, &c.

"6. Its greater steadiness and absence of jar and vibration experienced in other drills, which is very destructive to their working parts, &c.

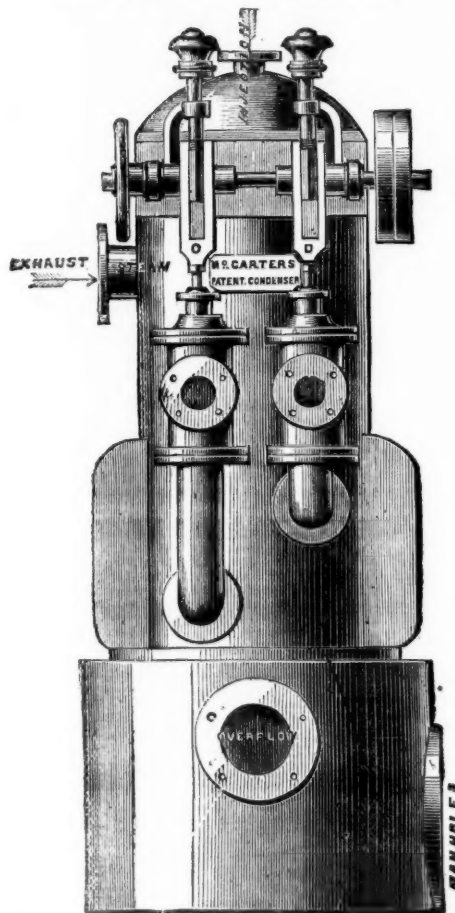
"7. Its greater power is some FORTY PER CENT. in favour of the Ingersoll."

Medals awarded for several years in succession "For the reason that we adjudge it so important in its use and complete in its construction as to supplant every article previously used for accomplishing the same purpose."

Estimates given for Air Compressors and all kinds of Mining Machinery. Send for Illustrated Catalogues. Price Lists, Testimonials, &c., as above.

LICENSED MAKERS.

KIRK, RAMSDEN, AND CO.
(LIMITED)
HUDDERSFIELD.



These Condensers can be placed inside or outside of the engine-house. They draw their own injection water, and require no foundation. Specially adapted to Pumping and Winding Engines, effecting a saving from 20 to 30 per cent. in coal, and increases the power of the Engine.

Engineers, Millwrights, Founders,
AND
FORGE PROPRIETORS.

Makers of Pumping, Winding, and Blowing Engines, Condensing and Non-condensing.
Horizontal and Beam Engines for all purposes.

IN THE SPRING Parr's Life Pills are used by Thousands.— They clear from the system all hurtful impurities, promote appetite, aid digestion, purify the blood, and keep the bowels regular. PERSONS SUFFERING from HEADACHE, Liver Complaints, Pains in the Shoulders and the Back, Gout, Rheumatism, and General Debility are particularly recommended to try

PARR'S LIFE PILLS

They have never been known to fail in affording immediate relief.

BLAKE'S NEW PATENT STONE BREAKER.

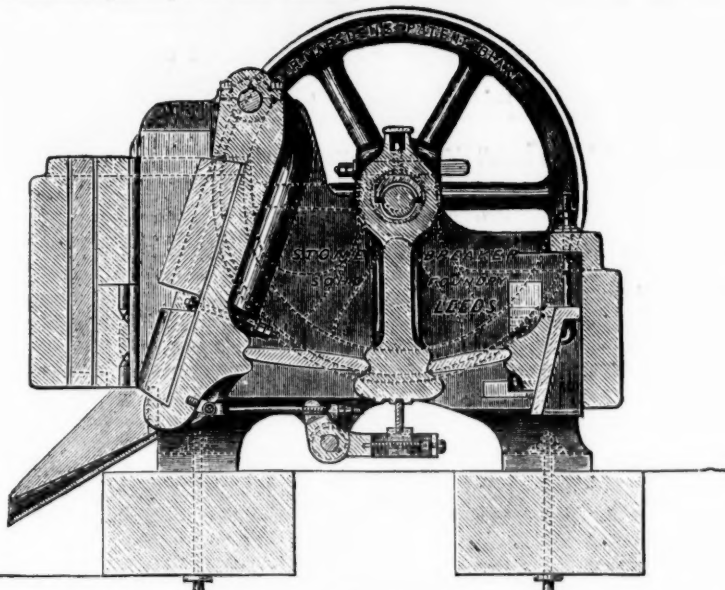
H. R. MARSDEN,

ORIGINAL PATENTEE, AND ONLY MAKER IN THE UNITED KINGDOM.—2000 IN USE.

These Machines are in extensive use amongst the Tin, Copper, Lead, and other Mines, and are showing a clear saving of 4d. and 6d. per ton over the ordinary mode of hand spalling, besides a diminution of stamping power equal to 30 per cent., which is a considerable saving. They are already well known to the mining world, and can be seen in operation at some of the leading Cornish and other Mines. For breaking the elvan rock they have established a decided supremacy over other Machinery.

Exclusively adopted by Her Majesty's Government, and by most Continental Governments.

Machines for Hand and Steam Power, specially designed and largely used for Crushing Pyrites, Limestone, Cement, Coal, Rocks, Ganister, &c., at all the principal works in the Kingdom.



Used by all the Great Mining Companies in the World, and are shown by Testimonials to effect a Saving of FIFTY per cent. over every other system.

Awarded 62 Gold and Silver Medals:—

Paris, 1867.
Santiago, 1869.
Leeds, 1875.
Leicester, 1868.
Cardiff, 1872.
Bolton, 1872.
Ayr, 1873-4-5-6, &c.

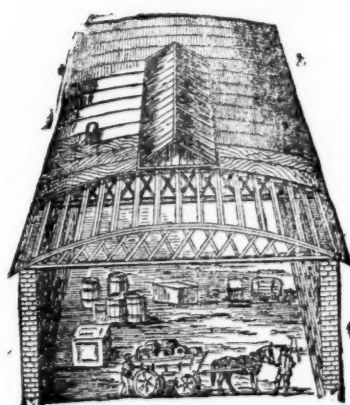
EXTRACTS FROM TESTIMONIALS.
"They occupy an important position as labour-saving Machines."—*Architect*.
"The Machine is well designed, simple, but substantially made, and is capable of reducing any material to fine gravel, such as copper ore, and is certainly preferable to the stamps in use for that purpose."—*Mining Journal*.
"Your Machine will crush from 60 to 120 tons of hard limestone per day of 10 hours."

This illustration shows my new patent REVERSIBLE Cubing Jaws, which are made in upper and lower sections, and the backs planed, so that when the bottom part of the lower section becomes worn it can be turned upside down, and thus made equal to new. This process does not require the aid of skilled labour, the white metal being entirely dispensed with.
THESE JAWS WILL WEAR FOUR TIMES longer than any other, and they can be renewed at a fractional cost.

"No Machine is equal to yours, combining as it does very great power, simplicity of construction, and cheapness."
"Mr. Marsden's Stone Breakers are so thoroughly well known and appreciated that it is unnecessary for us to describe their construction or speak of their merits."—*Engineering*.
"By the use of your Machine we have reduced the cost of breaking and forming road material to one-half its previous cost."
"Our 15 by 7 Machine has broken 4 tons of hard whinstone in 20 minutes for fine road metal, free from dust."

CATALOGUES, TESTIMONIALS, &c. (in the French or German language, if required), on application to the sole maker of "Blake's" Stone Breaker:—
H. R. MARSDEN, SOHO FOUNDRY, LEEDS, ENGLAND.

M'TEAR AND CO.'S CIRCULAR FELT ROOFING,



FOR GREAT ECONOMY AND CLEAR WIDE SPACE.
For particulars, estimates, and plans, address,—
M'TEAR & CO.,
ST. BENET CHAMBERS,
FENCHURCH STREET,
LONDON, E.C.;
4, PORTLAND STREET,
MANCHESTER;
OR
CORPORATION STREET,
BELFAST.

The above drawing shows the construction of this cheap and handsome roof, now much used for covering factories, stores, sheds, farm buildings, &c., the principal of which are double bow and string girders of best pine timber, sheathed with 1/2 in. boards, supported on the girders by purlins running longitudinally, the whole being covered with patent waterproof roofing felt. These roofs so combine lightness with strength that they can be constructed up to 100 ft. span without centre supports, thus not only affording a clear wide space, but effecting a great saving both in the cost of roof and uprights.
They can be made with or without top-lights, ventilators, &c. Felt roofs of any description executed in accordance with plans. Prices for plain roofs from 30s. to 60s. per square, according to span, size, and situation.
Manufacturers of PATENT FELTED SHEATHING, for covering ships' bottoms under copper or zinc.
DRY HAIR FELT, for deadening sound and for covering steam pipes, thereby saving 25 per cent. in fuel by preventing the radiation of heat.
PATENT ASPHALTE ROOFING FELT, price 1d. per square foot.
Wholesale buyers and exporters allowed liberal discounts.
PATENT ROOFING VARNISH, in boxes from 3 gallons to any quantity required 8d. per gallon.



By a special method of preparation, this leather is made solid, perfectly close in texture, and impermeable to water; it has, therefore, all the qualifications essential for pump buckets, and is the most durable material of which they can be made. It may be had of all dealers in leather, and of—

I. AND T. HEPBURN AND SONS,
TANNERS AND CURRIERS, LEATHER MILLBAND AND HOSE PIPE MANUFACTURERS,
LONG LANE, SOUTHWARK, LONDON
Prize Medals, 1851, 1855, 1862, for
MILL BANDS, HOSE, AND LEATHER FOR MACHINERY PURPOSES.

THE GREAT ADVERTISING MEDIUM FOR WALES.
THE SOUTH WALES EVENING TELEGRAM
(DAILY), and
SOUTH WALES GAZETTE
(WEEKLY), established 1857,
the largest and most widely circulated papers in Monmouthshire and South Wales.
CHIEF OFFICES—NEWPORT, MON.; and at CARDIFF.

The "Evening Telegram" is published daily, the first edition at Three P.M., the second at Five P.M. On Friday, the "Telegram" is combined with the South Wales Weekly Gazette, and advertisements ordered for not less than six consecutive insertions will be inserted at a uniform charge in both papers.
P.O.O. and cheques payable to Henry Russell Evans, 14, Commercial-street, Newport, Monmouthshire.

MINING PROSPECTUSES AND ANNOUNCEMENTS OF PUBLIC COMPANIES should be inserted in the BARNSTAPLE TIMES, published every Tuesday, and in the DEVON POST, published every Saturday, as these papers circulate largely throughout Devon and Cornwall, where many thousands of investors reside. Legal and Public Companies' advertisements, 6d. a line each insertion; Trade and Auctions, 4d. a line; Wanted, &c., 2d. words, 1s.
Published by J. B. JONES, Boutport-street, Barnstaple, Devon, to whom all orders by post or telegraph should be sent.

BRYDON AND DAVIDSON'S ROCK DRILL.

SELECTED BY THE BRITISH AND OTHER GOVERNMENTS.

Reduced prices of this Rock Drill (formerly called "Kainotomon"), Nos. 1 and 2, £32 and £34. SUBJECT TO DISCOUNT.

IMPROVED AIR COMPRESSORS.

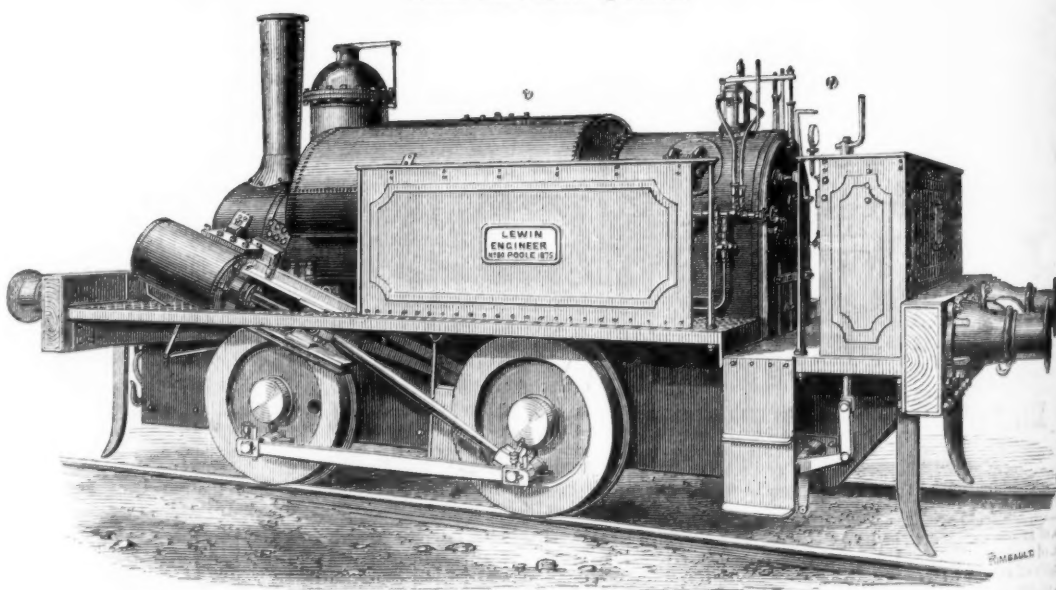
Makers of Pumping and Winding Engines, Steam Hammers, Boilers, Pump Pipes, &c., &c. Castings of all kinds.

BRYDON AND DAVIDSON, ENGINEERS,
WHITEHAVEN.

LEWIN, POOLE, DORSET, OR 110, CANNON STREET, LONDON, E.C.

Speciality in cheap colliery and contractors' Locomotives, and very small Locomotives for replacing Horses.

Prices from £300 upwards.



PORTABLE FIXED AND VERTICAL ENGINES. WINDING AND PUMPING GEAR.

The above represents LEWIN'S 10 by 18 DIRECT-ACTING LOCOMOTIVE, taken from a photo of one on a 4 ft. 8 1/2 in. gauge.

STREET AND ROAD TRAMWAY LOCOMOTIVES, ON THE MOST IMPROVED PRINCIPLE.